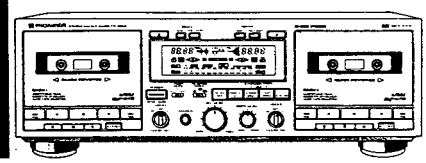
PIONEER®
*The Art of Entertainment*

# Service Manual



ORDER NO.
**ARP2194**

## STEREO DOUBLE CASSETTE DECK

# CT-W51
# CT-W950R
# CT-W960R

### CT-W51, CT-W950R AND CT-W960R HAVE THE FOLLOWING:

| Type | Model | | | Power Requirement | Remarks |
|---|---|---|---|---|---|
| | CT-W51 | CT-W950R | CT-W960R | | |
| KUC | ○ | – | – | AC120V only | |
| HEM | – | ○ | – | AC220V–230V, 230V–240V (switchable)* | |
| HB | – | ○ | – | AC220V–230V, 230V–240V (switchable)* | |
| SD | – | – | ○ | AC110V, 120V–127V, 220V, 240V (switchable) | |

* Change the primary wiring of the power transformer.

- **This manual is applicable to the CT-W51/KUC, CT-W950R/HEM, HB and CT-W960R/SD types.**
- **As to the CT-W950R/HEM, HB and CT-W960R/SD types, refer to page 46.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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T-W51

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**This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.**
**Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.**

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

# 1. SAFETY INFORMATION

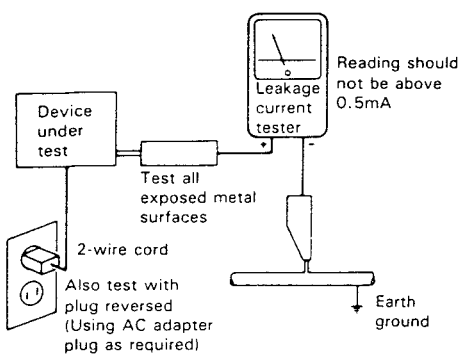
(FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

**LEAKAGE CURRENT CHECK**

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

### 2. PRODUCT SAFETY NOTICE'

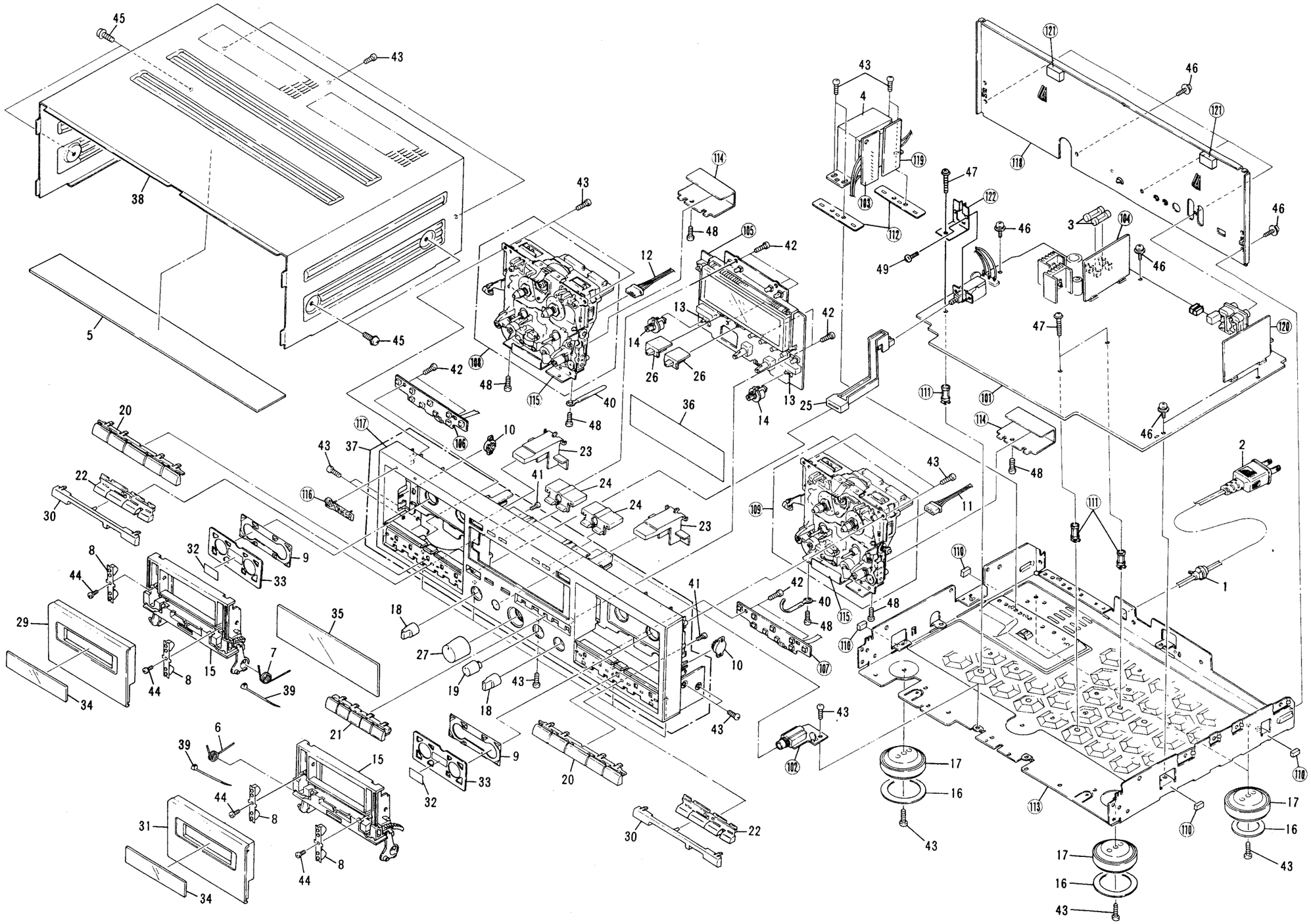
Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

# 2. EXPLODED VIEWS, PACKING AND PARTS LIST

## 2.1 EXTERIOR

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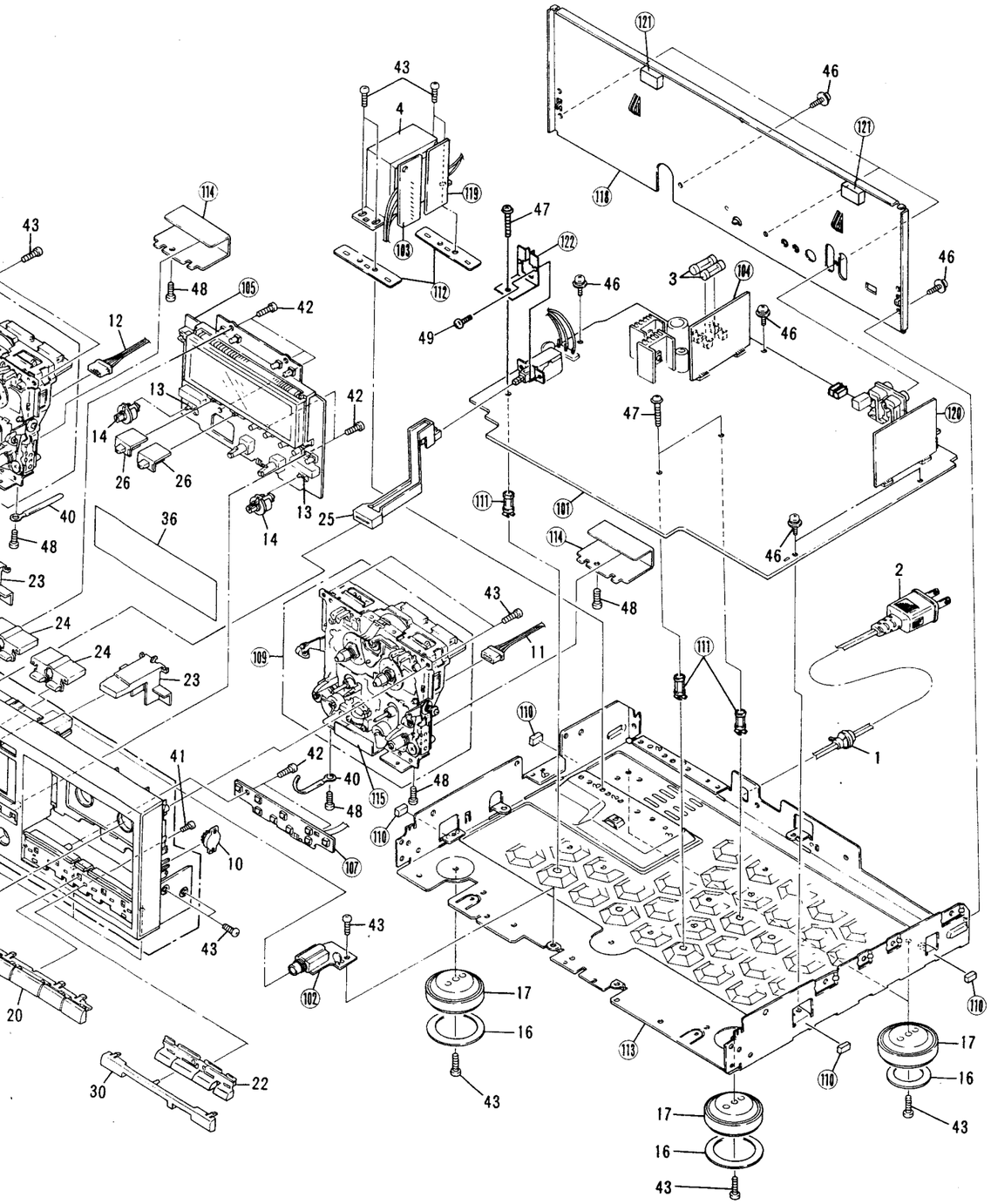


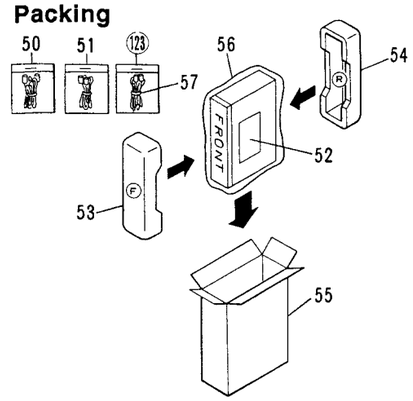

NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

## Parts List of Exterior

| Mark | No. | Description | Part No. |
|---|---|---|---|
| ⚠ | 1 | Strain relief | CM – 22C |
| ⚠ | 2 | AC Power cord | PDG1015 |
| ⚠ | 3 | FU1001, FU1002 Fuse (1.5A) | REK1001 |
| ⚠ | 4 | Power transformer | RTT1162 |
| | 5 | Absorb plate (B) | PNB1109 |
| | 6 | Door spring (L) | RBH1224 |
| | 7 | Door spring (R) | RBH1225 |
| | 8 | Half pressure spring | RBK1013 |
| | 9 | Stabilizer (B) | REB1085 |
| | 10 | Damper assembly | REC1005 |
| | 11 | Connector assembly 5P | RKP1323 |
| | 12 | Connector assembly 5P | RKP1332 |
| | 13 | SW cap | RNK1522 |
| | 14 | Rotary SW shaft | RNK1523 |
| | 15 | Door pocket | RNT1010 |
| | 16 | Stopper | VEC1061 |
| | 17 | Insulator | VNK1095 |
| | 18 | Knob B (DOLBY NR) | RAC1414 |
| | 19 | VR knob B (COPY LEVEL) | RAC1421 |
| | 20 | Operation knob A (◀◀, ◀, ■, ▶, ▶▶) | RAC1479 |
| | 21 | Operation knob C (SYNCHRO COPY) | RAC1423 |
| | 22 | BLE knob (●, ❚❚, ●, AUTO – BLE) | RAC1601 |
| | 23 | Eject knob | RAC1425 |
| | 24 | Counter knob | RAC1426 |
| | 25 | Power knob | RAC1427 |
| | 26 | Slide knob (TIMER MODE, REVERSE MODE) | RAC1428 |
| | 27 | VR knob A(REC LEVEL) | RAC1430 |
| | 28 | ..... | |
| | 29 | Door cover | RAH1795 |
| | 30 | BLE mold | RAH1729 |
| | 31 | Door cover | RAH1796 |
| | 32 | Remain display paper | REE – 113 |
| | 33 | Stabilizer panel | RAH1483 |
| | 34 | Door lens | RAH1553 |
| | 35 | FL lens | RAH1883 |
| | 36 | FL filter | RAH1596 |
| | 37 | Front panel assembly | RXX1411 |
| | 38 | Bonnet | RXX1297 |
| | 39 | Binder | REC – 371 |
| | 40 | Cord clamper | RNH – 184 |
| | 41 | Screw | BBZ20P060FMC |
| | 42 | Screw | BBZ30P060FZK |
| | 43 | Screw | BBZ30P080FCC |
| | 44 | Screw | BPZ20P060FMC |
| | 45 | Screw | FBT40P080FZK |
| | 46 | Screw | IBZ30P060FCC |
| | 47 | Screw | IBZ30P150FCU |
| | 48 | Screw | BCZ26P050FMC |
| | 49 | Screw | PMA30P060FCU |
| | 50 | Mini connection cord | PDE – 319 |
| | 51 | Control cord | RDE1030 |
| | 52 | Operating instructions (English) | RRB1079 |
| | 53 | Pad F | RHA1044 |
| | 54 | Pad R | RHA1045 |
| | 55 | Packing case | RHG1286 |
| | 56 | Sheet | RHX – 034 |
| | 57 | Connection cord | RDE – 010 |
| | 101 | Main unit | |
| | 102 | H.Phone unit | |
| | 103 | Trans 2 unit | |
| | 104 | REC (1) unit | |
| | 105 | Display unit | |
| | 106 | Control SW (1) unit | |
| | 107 | Control SW (2) unit | |
| | 108 | Mechanism unit | |
| | 109 | Mechanism unit | |
| | 110 | Spacer | |
| | 111 | PCB spacer | |
| | 112 | Transformer sheet | |
| | 113 | Main chassis | |
| | 114 | Mechanism shield plate | |
| | 115 | Mechanism bracket | |
| | 116 | Name plate | |
| | 117 | Front panel | |
| | 118 | Rear panel | |
| | 119 | Trans 1 unit | |
| | 120 | REC (2) unit | |
| | 121 | UNIT spacer | |
| | 122 | SW bracket | |
| | 123 | Connection cord assembly | |

### Packing

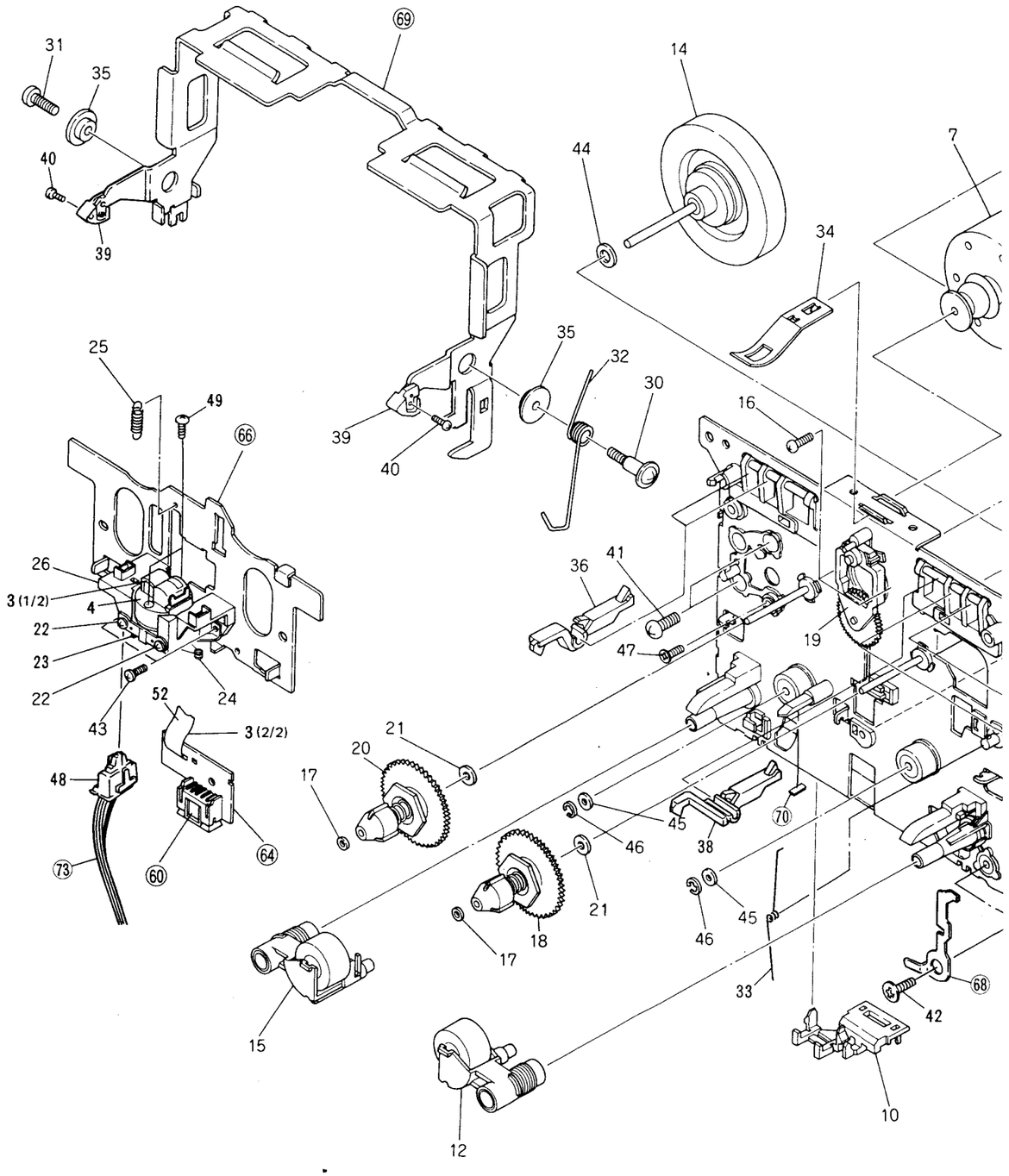


## 2.2 Parts List of Mechanism Unit (Deck I)

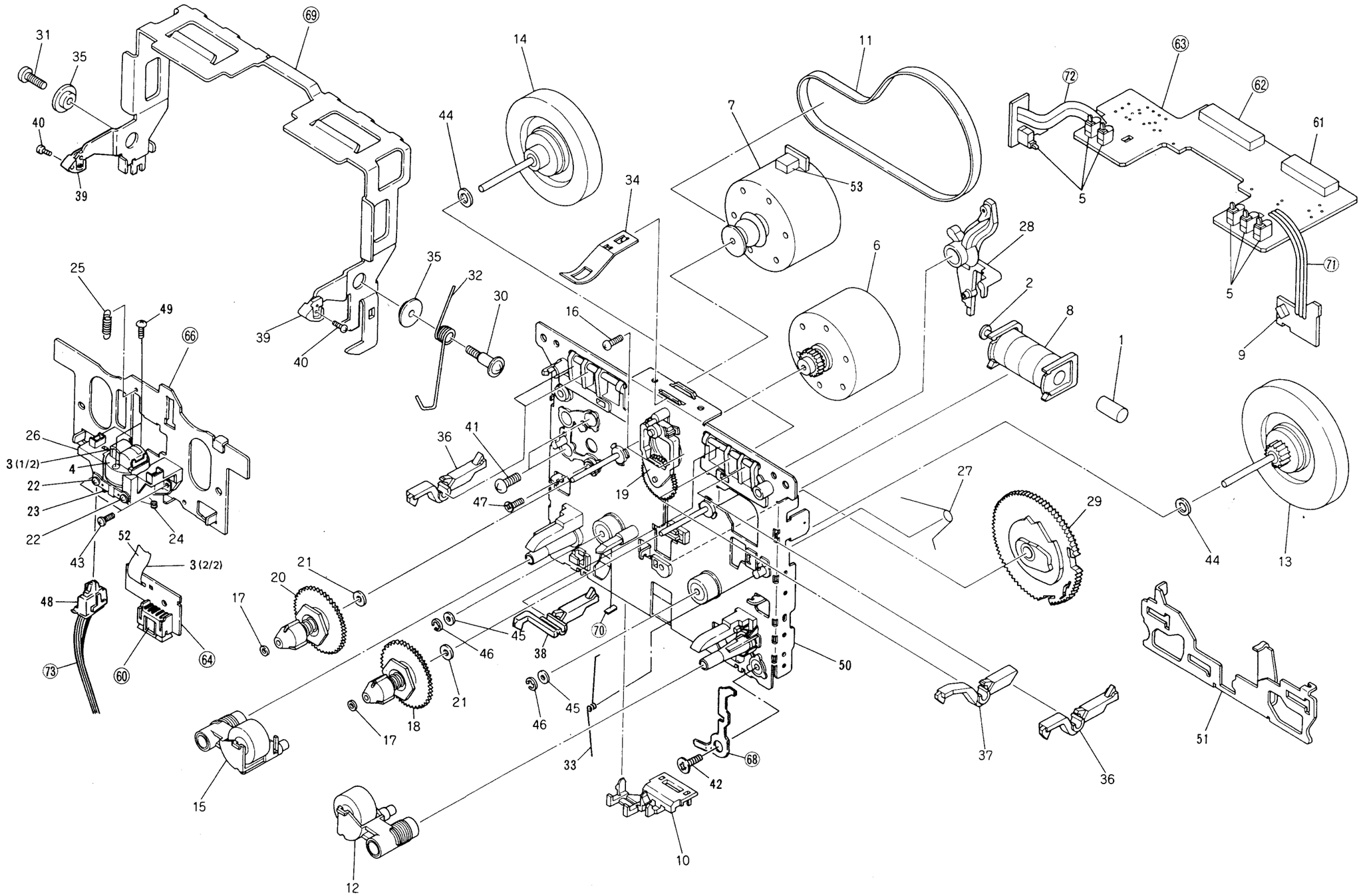
| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Shaft | RLA1130 |
| | 2 | Planger | RLA1132 |
| | 3 | HEAD assembly (R/P) | RXA1373 |
| | 4 | R/P, E head | RPB1033 |
| | 5 | Push switch | RSG1018 |
| | 6 | Reel motor (BLK) | RXM1029 |
| | 7 | Main motor (BLK) | RXM1030 |
| | 8 | Solenoid (BLK) | RXP1010 |
| | 9 | Photo transistor | SPI3534FG |
| | 10 | Wire holder | RNK1530 |
| | 11 | Main belt | REB1157 |
| | 12 | Pinch roller assembly (DIA 2.5) | RXA1183 |
| | 13 | Flywheel assembly | RXA1346 |
| | 14 | Flywheel assembly | RXA1295 |
| | 15 | Pinch roller assembly(L) | RXA1296 |
| | 16 | Screw | RBA1076 |
| | 17 | Washer | RBF – 057 |
| | 18 | Reel base (BLK) | RXA1184 |
| | 19 | Idler (BLK) | RXA1248 |
| | 20 | Reel base (BLK) | RXC – 040 |
| | 21 | Washer | RBF1038 |
| | 22 | Azimuth screw | RBA1080 |
| | 23 | Azimuth spring | RBK1029 |
| | 24 | Rotation spring | RBL – 085 |
| | 25 | Head base spring | RBL1003 |
| | 26 | Housing head (BLK) | RXA1293 |
| | 27 | Slide spring | RBH1239 |
| | 28 | Play arm | RNK1525 |
| | 29 | Cam gear (3R) | RNK1672 |
| | 30 | Screw | RBA1078 |
| | 31 | Screw | RBA1079 |
| | 32 | Eject lever spring (R) | RBH1233 |
| | 33 | Eject prevention spring (R) | RBH1230 |
| | 34 | Cassette hold spring | RBK1031 |
| | 35 | Lever collar (A) | RLA1133 |
| | 36 | REC detection lever | RNK1527 |
| | 37 | PACK detection lever(P) | RNK1543 |
| | 38 | Metal detection lever(R) | RNK1537 |
| | 39 | Hook | RNM – 160 |
| | 40 | Screw | PCZ20P040FMC |
| | 41 | Screw | PMZ26P050FMC |
| | 42 | Screw | RBA1048 |
| | 43 | Screw | RBA1077 |
| | 44 | Washer | WA26D045D025 |
| | 45 | Washer | WA26D047D050 |
| | 46 | Washer | YE15FUC |
| | 47 | Screw | PBZ30P080FMC |
| | 48 | Quick sensor | SPI – 320 – AB |
| | 49 | Screw | PMZ14P050FNI |
| | 50 | Chassis base (BLK) | RXA1291 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 51 | Slide plate | RNE1345 |
| | 52 | HD FPC (PB) | RNP1232 |
| | 53 | Holder cushion (L) | RED1027 |
| | 60 | Connector (5P) | |
| | 61 | Connector (8P) | RKP1327 |
| | 62 | Connector (12P) | |
| | 63 | P.C. Board | |
| | 64 | Head P.C.B (R/P) | |
| | 65 | ..... | |
| | 66 | Head base | |
| | 67 | ..... | |
| | 68 | Eject prevention arm (R) | |
| | 69 | Eject lever (WR) | |
| | 70 | Reflection plate | |
| | 71 | Jumper wire | |
| | 72 | Jumper wire | |
| | 73 | Wire | |

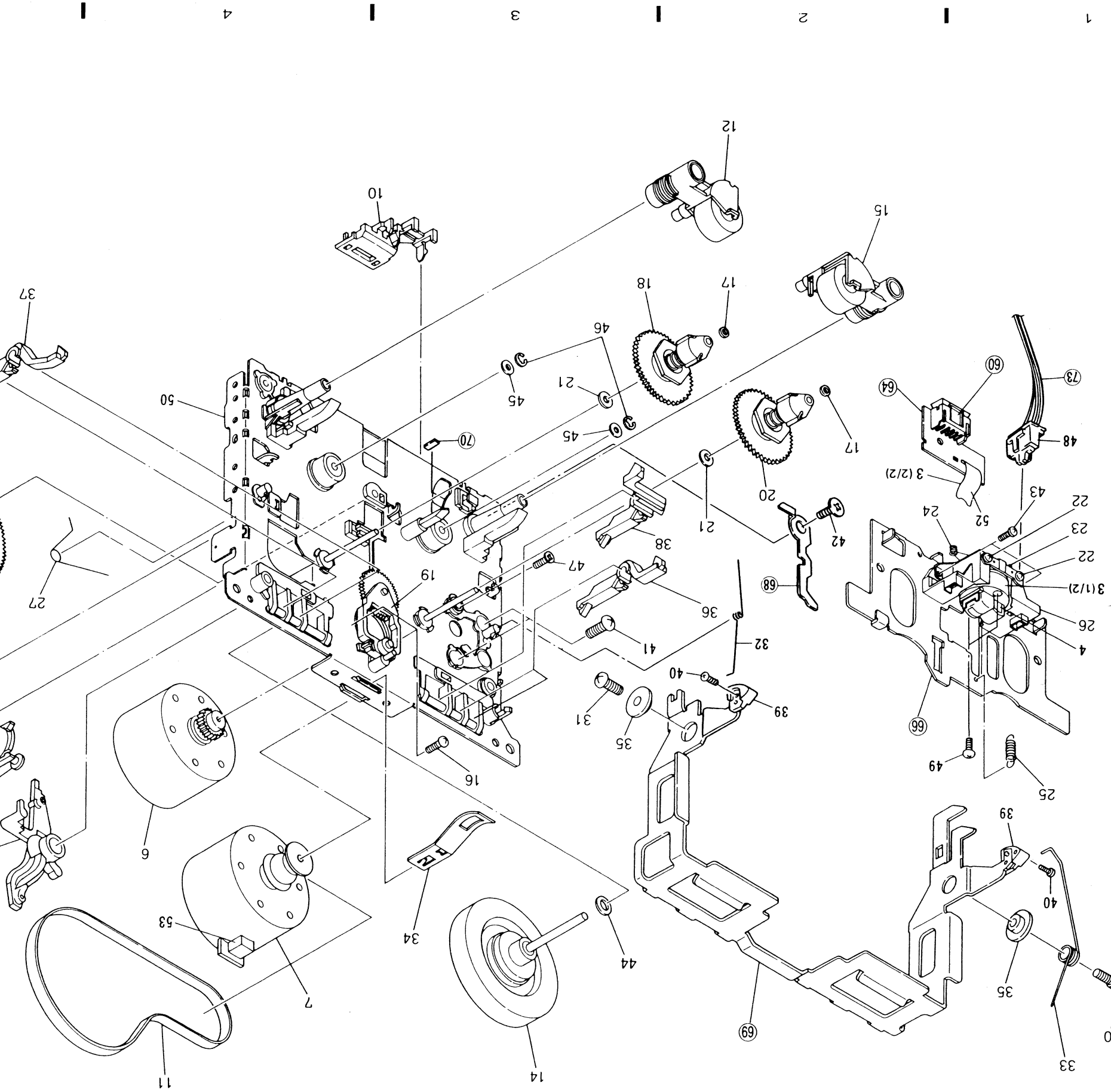
**Mechanism Unit (Deck I)**



**Mechanism Unit (Deck 1)**



## 2.3 MECHANISM UNIT (DECK II)






ORS :
d in Ω, 1/6W, ±5% tolerance unless otherwise noted
M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20%
e.

TORS :
d in capacity (μF) / voltage (V) unless otherwise noted p ; pF.
n without voltage is 50V except electrolytic capacitor.

E CURRENT :
DC voltage (V) at no input signal.
DC current at no input signal.

:
al route.
usting point.
mark found on some component parts indicates the
nce of the safety factor of the part. Therefore, when
, be sure to use parts of identical designation.
ed capacitors and resistors have parts numbers.

the basic schematic diagram, but the actual circuit may
e to improvements in design.

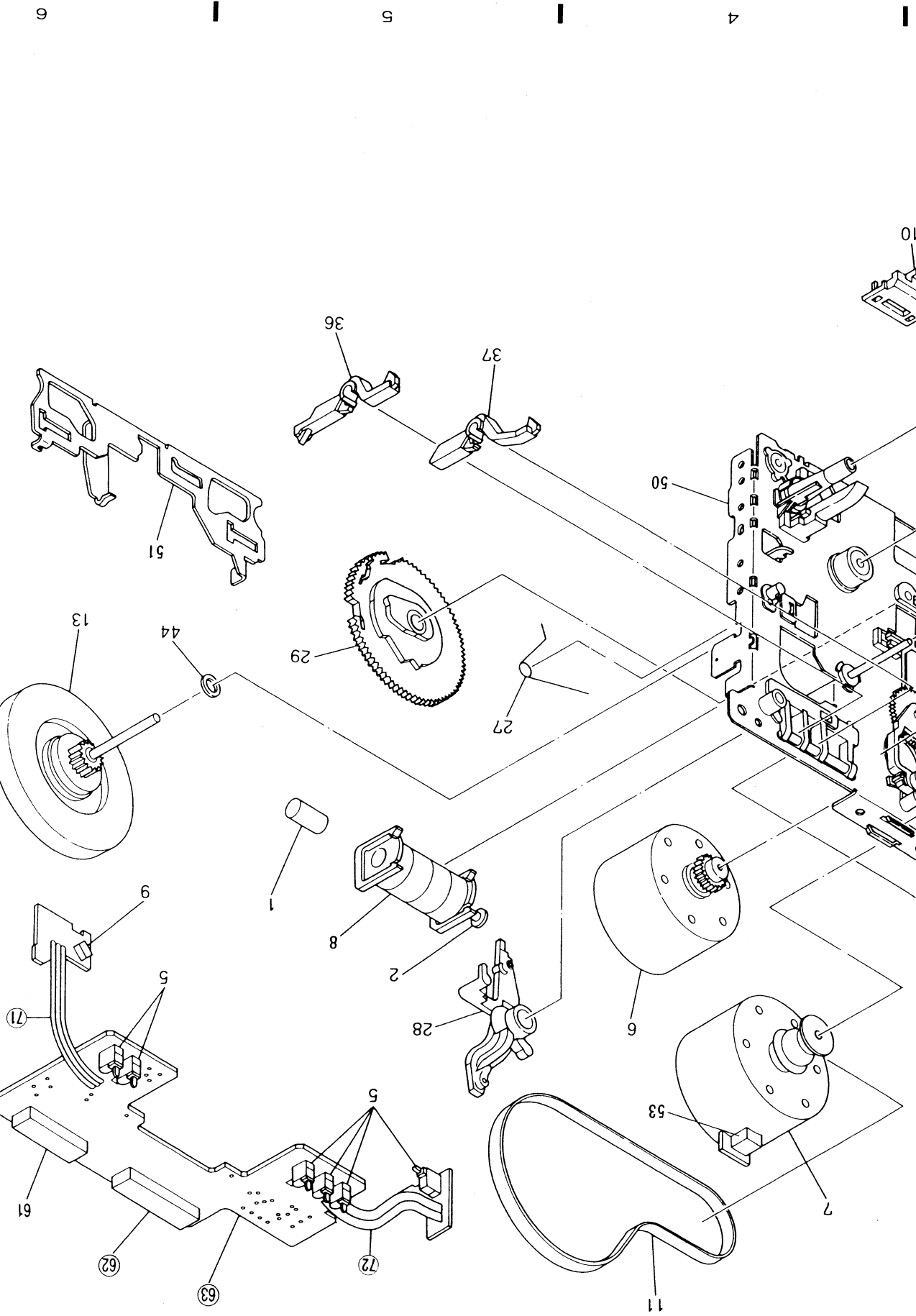
5. SWITCHES (Underline indicates switch position)

POWER SW UNIT
S1201 : ON – OFF

OPERATE 1 UNIT
S1301 : FWD
S1302 : REV
S1303 : STOP
S1304 : REC
S1305 : FF
S1306 : REW
S1307 : PAUSE
S1308 : MUTE
S1309 : I AUTO BLE

OPERATE 2 UNIT
S1401 : FWD
S1402 : REV
S1403 : STOP
S1404 : REC
S1405 : FF
S1406 : REW
S1407 : PAUSE
S1408 : MUTE
S1409 : II AUTO BLE

DISPLAY UNIT
S1501 : CD CYNC
S1502 : PARAREL
S1503 : X2 COPY
S1504 : X1 COPY
S1505 : 2 – COUNTER MODE
S1506 : 2 – COUNTER REST
S1507 : 1 – COUNTER MODE
S1508 : 1 – COUNTER REST
S1509 : SKIP/RELAY
S1510 : REV MODE ⇄ – ⊃ – ↻
S1511 : T.REC – OFF – T.RELAY
S1512 : I DOLBY B – OFF – C
S1513 : II DOLBY B – OFF – C




## Parts List of Mechanism Unit (Deck II)

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Shaft | RLA1130 |
| | 2 | Plangar | RLA1132 |
| | 3 | Head assembly (R/P) | RXA1373 |
| | 4 | R/P, E head | RPB1033 |
| | 5 | Push switch | RSG1018 |
| | 6 | Reel motor (BLK) | RXM1029 |
| | 7 | Main motor (BLK) | RXM1030 |
| | 8 | Solenoid (BLK) | RXP1010 |
| | 9 | Photo transistor | SPI3534FG |
| | 10 | Wire holder | RNK1530 |
| | 11 | Main belt | REB1157 |
| | 12 | Pinch roller assembly (DIA2.5) | RXA1183 |
| | 13 | Flywheel assembly | RXA1346 |
| | 14 | Flywheel assembly | RXA1295 |
| | 15 | Pinch roller assembly(L) | RXA1296 |
| | 16 | Screw | RBA1076 |
| | 17 | Washer | RBF – 057 |
| | 18 | Reel base (BLK) | RXA1184 |
| | 19 | Idler (BLK) | RXA1248 |
| | 20 | Reel base (BLK) | RXC – 040 |
| | 21 | Washer | RBF1038 |
| | 22 | Azimuth screw | RBA1080 |
| | 23 | Azimuth spring | RBK1029 |
| | 24 | Rotation spring | RBL – 085 |
| | 25 | Head base spring | RBL1003 |
| | 26 | Housing head (BLK) | RXA1293 |
| | 27 | Slide spring | RBH1239 |
| | 28 | Play arm | RNK1525 |
| | 29 | Cam gear (3R) | RNK1672 |
| | 30 | Screw | RBA1078 |
| | 31 | Screw | RBA1079 |
| | 32 | Eject prevention spring (L) | RBH1234 |
| | 33 | Eject lever spring (L) | RBH1231 |
| | 34 | Cassette hold spring | RBK1031 |
| | 35 | Lever collar (A) | RLA1133 |
| | 36 | REC detection lever | RNK1527 |
| | 37 | PACK detection lever(P) | RNK1543 |
| | 38 | Metal detection lever(L) | RNK1529 |
| | 39 | Hook | RNM – 160 |
| | 40 | Screw | PCZ20P040FMC |
| | 41 | Screw | PMZ26P050FMC |
| | 42 | Screw | RBA1048 |
| | 43 | Screw | RBA1077 |
| | 44 | Washer | WA26D045D025 |
| | 45 | Washer | WA26D047D050 |
| | 46 | Washer | YE15FUC |
| | 47 | Screw | PBZ30P080FMC |
| | 48 | Quick sensor | SPI – 320 – AB |
| | 49 | Screw | PMZ14P050FNI |
| | 50 | Chassis base (BLK) | RXA1291 |

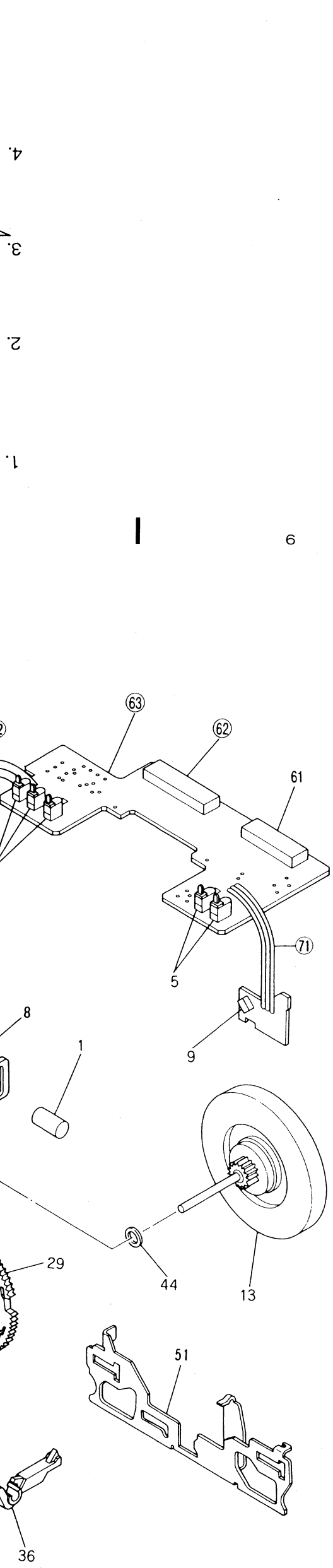
1. RESISTORS :
   Indicated in Ω, 1/6W, ±5% tolerance unless other
   k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (
   tolerance.

2. CAPACITORS :
   Indicated in capacity (μF)/voltage (V) unless otherwise
   Indication without voltage is 50V except electrolytic

3. VOLTAGE CURRENT :
   ; DC voltage (V) at no input signal.
   ⬅mA ; DC current at no input signal.

4. OTHERS :
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts ind
   importance of the safety factor of the part. Theref
   replacing, be sure to use parts of identical designatio
   ※ marked capacitors and resistors have parts number

   This is the basic schematic diagram, but the actual c
   vary due to improvements in design.

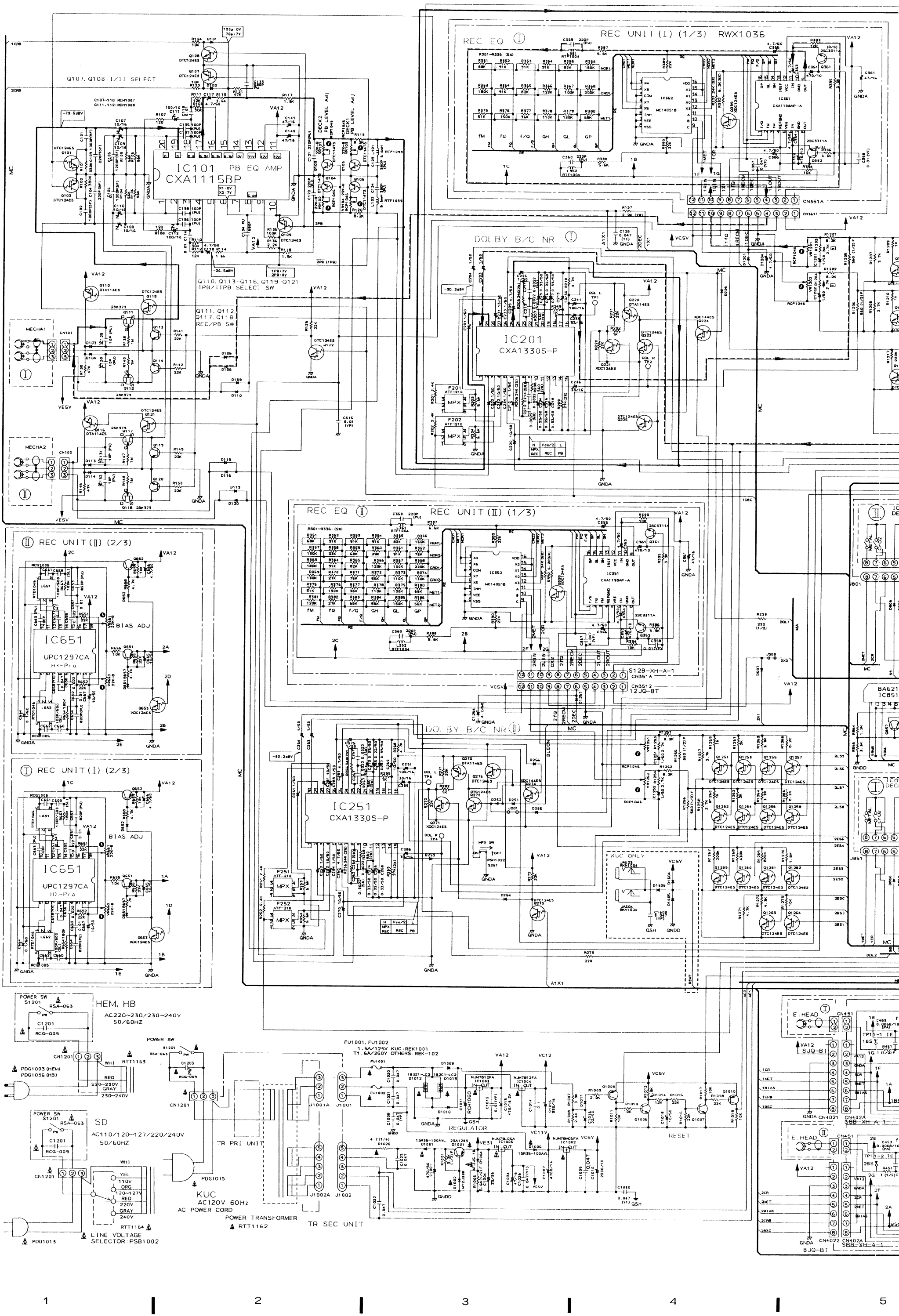



## Parts List of Mechanism Unit (Deck II)

| Mark | No. | Description | Part No. |
|---|---|---|---|
| A | 1 | Shaft | RLA1130 |
| | 2 | Planger | RLA1132 |
| | 3 | Head assembly (R/P) | RXA1373 |
| | 4 | R/P, E head | RPB1033 |
| | 5 | Push switch | RSG1018 |
| | 6 | Reel motor (BLK) | RXM1029 |
| | 7 | Main motor (BLK) | RXM1030 |
| | 8 | Solenoid (BLK) | RXP1010 |
| — | 9 | Photo transistor | SPI33534FG |
| | 10 | Wire holder | RNK1530 |
| | 11 | Main belt | REB1157 |
| | 12 | Pinch roller assembly (DIA2.5) | RXA1183 |
| | 13 | Flywheel assembly | RXA1346 |
| | 14 | Flywheel assembly | RXA1295 |
| | 15 | Pinch roller assembly(L) | RXA1296 |
| B | 16 | Screw | RBA1076 |
| | 17 | Washer | RBF – 057 |
| | 18 | Reel base (BLK) | RXA1184 |
| | 19 | Idler (BLK) | RXA1248 |
| | 20 | Reel base (BLK) | RXC – 040 |
| | 21 | Washer | RBF1038 |
| | 22 | Azimuth screw | RBA1080 |
| | 23 | Azimuth spring | RBK1029 |
| — | 24 | Rotation spring | RBL – 085 |
| | 25 | Head base spring | RBL1003 |
| | 26 | Housing head (BLK) | RXA1293 |
| | 27 | Slide spring | RBH1239 |
| | 28 | Play arm | RNK1525 |
| | 29 | Cam gear (3R) | RNK1672 |
| | 30 | Screw | RBA1078 |
| C | 31 | Screw | RBA1079 |
| | 32 | Eject prevention spring (L) | RBH1234 |
| | 33 | Eject lever spring (L) | RBH1231 |
| | 34 | Cassette hold spring | RBK1031 |
| | 35 | Lever collar (A) | RLA1133 |
| | 36 | REC detection lever | RNK1527 |
| | 37 | PACK detection lever(P) | RNK1543 |
| | 38 | Metal detection lever(L) | RNK1529 |
| — | 39 | Hook | RNM – 160 |
| | 40 | Screw | PCZ20P040FMC |
| | 41 | Screw | PMZ26P050FMC |
| | 42 | Screw | RBA1048 |
| | 43 | Screw | RBA1077 |
| | 44 | Washer | WA26D045D025 |
| | 45 | Washer | WA26D047D050 |
| D | 46 | Washer | YE15FUC |
| | 47 | Screw | PBZ30P080FMC |
| | 48 | Quick sensor | SPI – 320 – AB |
| | 49 | Screw | PMZ14P050FNI |
| | 50 | Chassis base (BLK) | RXA1291 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 51 | Slide plate | RNE1345 |
| | 52 | HD FPC (R/P) | RNP1232 |
| | 53 | Holder cushion (L) | RED1027 |
| | 60 | Connector (5P) | |
| | 61 | Connector (8P) | RKP1327 |
| | 62 | Connector (12P) | |
| | 63 | P.C. Board | |
| | 64 | Head P.C.B (R/P) | |
| | 65 | ..... | |
| | 66 | Head base | |
| | 67 | ..... | |
| | 68 | Eject prevention arm (L) | |
| | 69 | Eject lever (WL) | |
| | 70 | Reflection plate | |
| | 71 | Jumper wire | |
| | 72 | Jumper wire | |
| | 73 | Wire | |

# 3. SCHEMATIC DIAGRAM



NOTE: If the parts are not identified in the the diagram, the followings are used.

1SS254 DTC124ES DTA114ES
2SA1309A DTA114TS DTC114ES
2SC3311A DTC114TS

REC UNIT(I) (1/3) RWX1036

REC UNIT(I) (3/3)

REC UNIT(II) (3/3)

IC801, QB01-Q806 DECK II MECHA CONT

IC851, Q851-Q856 DECK I MECHA CONT

TAPE SPEED ADJ

BIAS OSC 1

BIAS OSC 2

MUSIC SEARCH

H. PHONE AMP

BA15218N 400Hz LPF

400Hz LEVEL ADJ.

10kHz LEVEL ADJ.

10kHz Buffer AMP

MAIN UNIT

SYSTEM CONTROL

DISPLAY UNIT (1/2)

DOLBY SW.

OPERATE1 UNIT

LEADER DET

RESET

KUC ONLY

SD ONLY

S1301~1309: RSG1033

CD-DECK SYNCHRO

NOTE: If the parts are not identified in the the diagram, the followings are used.

1SS254 · DTC124ES · DTA114ES
2SA1309A · DTA114TS · DTC114ES
2SC3311A · DTC114TS

MAIN UNIT

H. PHONE AMP

H. PHONE UNIT

DISPLAY UNIT (2/2)

MA SYSTEM CONTROL

BA15218N 400Hz LPF

10kHz Buffer AMP

MUSIC SEARCH

RAW1076 (HEM, HB)
RAW1080 (KUC, SD)

DISPLAY UNIT (1/2)

REC UNIT (I) (3/3)

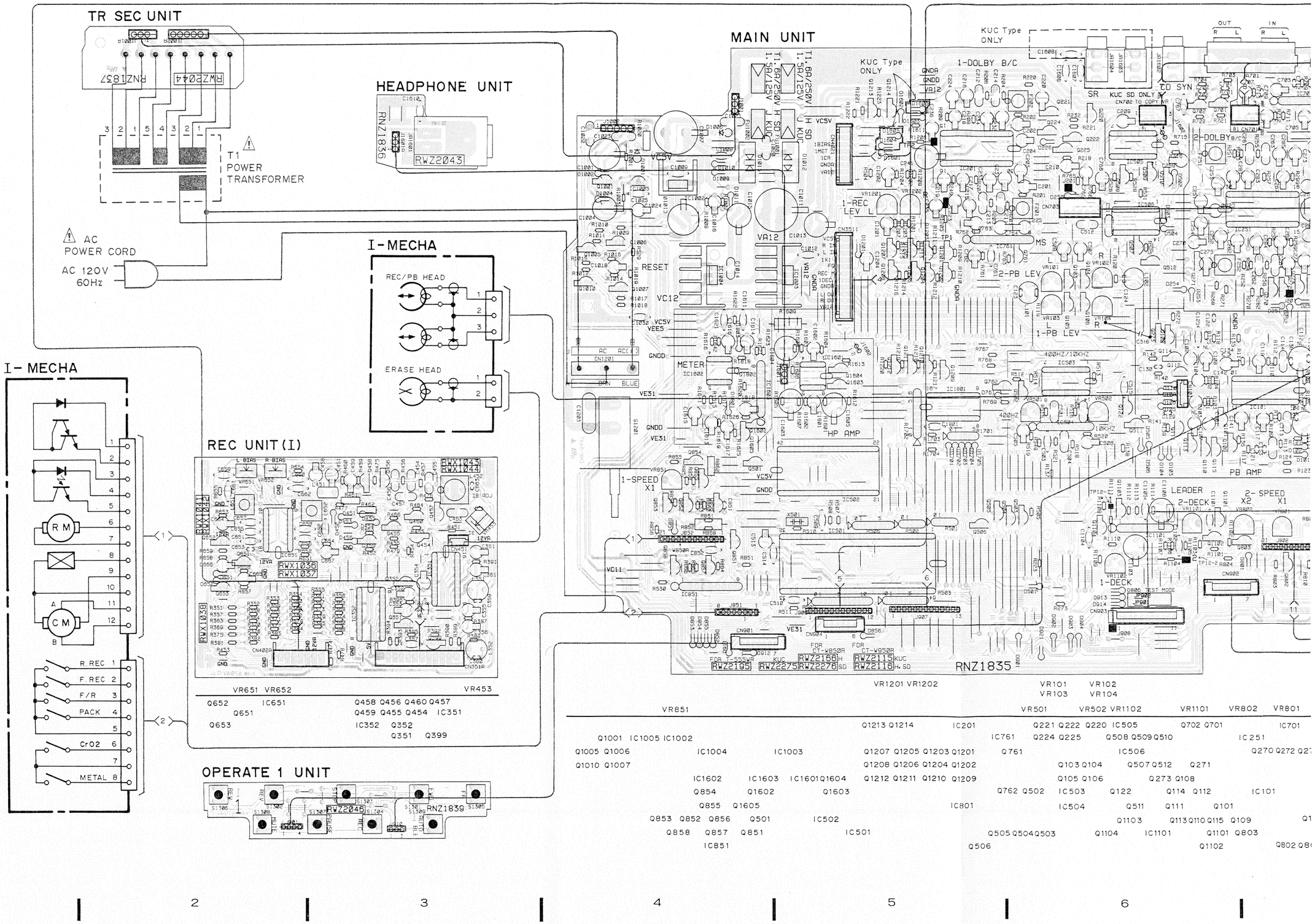
REC UNIT (II) (3/3)

OPERATE1 UNIT

OPERATE2 UNIT

PLAYBACK SIGNAL
RECORDING SIGNAL

# 4. P.C. BOARDS CONNECTION DIAGRAM



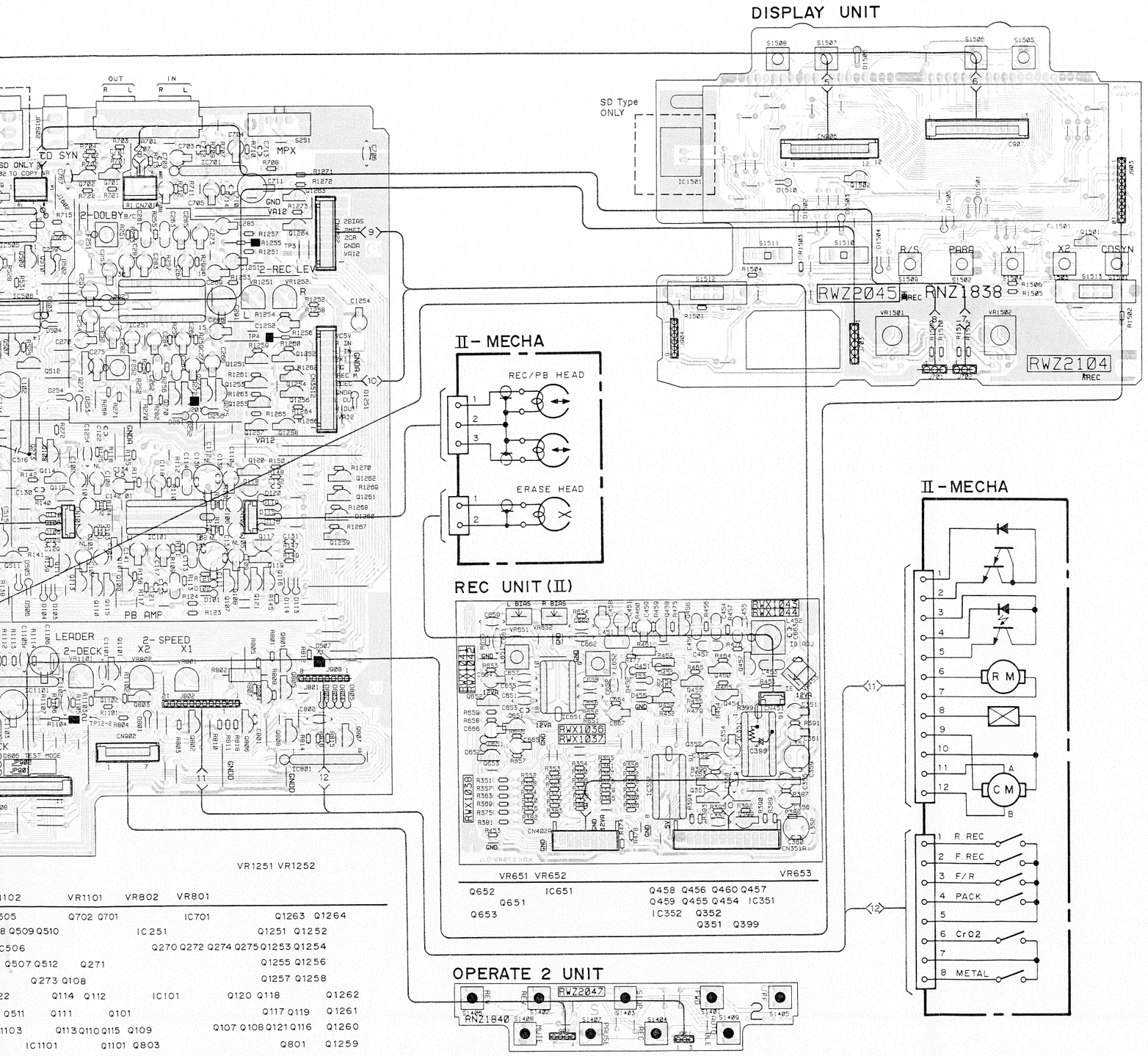

VR651 VR652 VR453

Q652 IC651 Q458 Q456 Q460 Q457
Q651 Q459 Q455 Q454 IC351
Q653 IC352 Q352
Q351 Q399

VR1201 VR1202 VR101 VR102 VR103 VR104

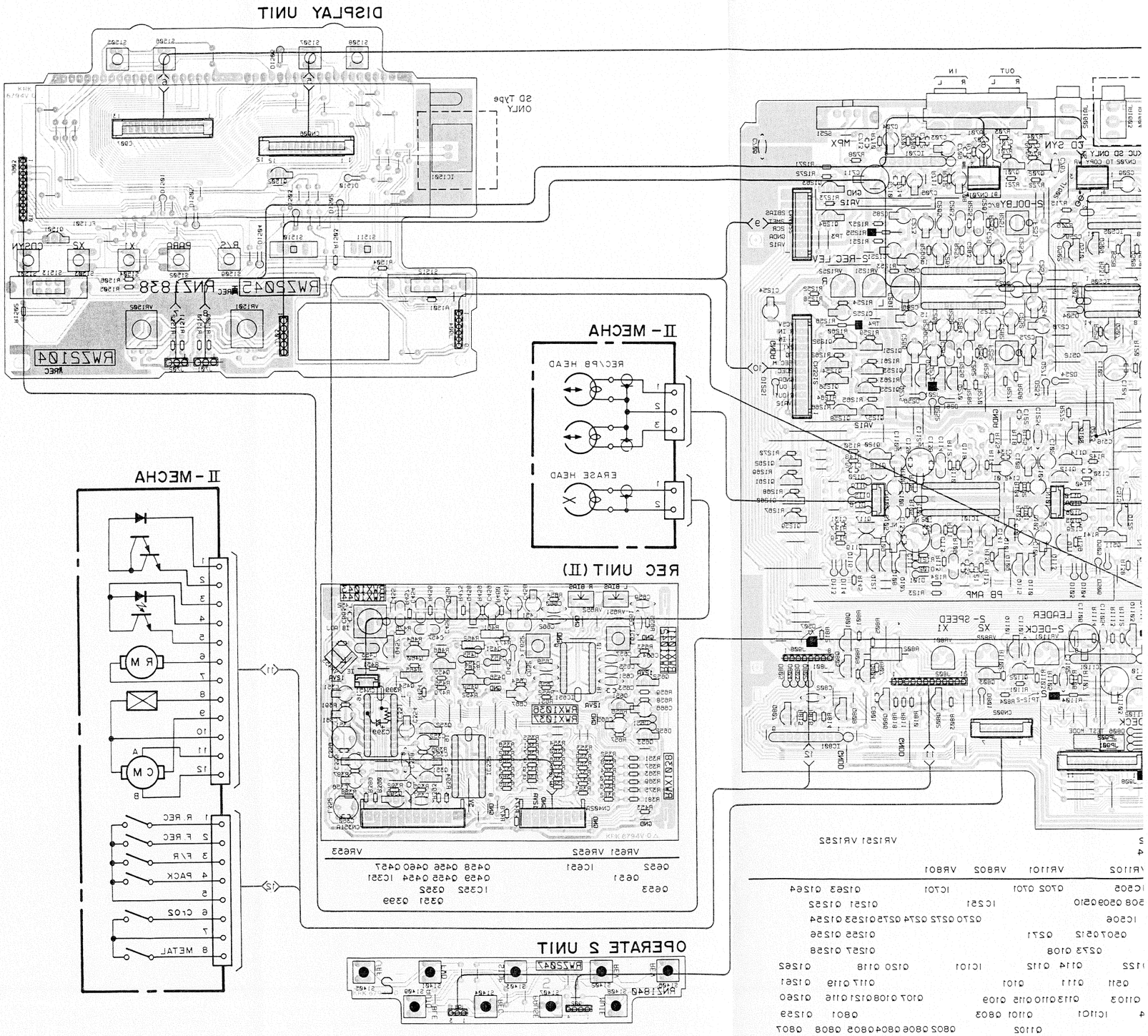
VR851 VR501 VR502 VR1102 VR1101 VR802 VR801

Q1213 Q1214 IC201 Q221 Q222 Q220 IC505 Q702 Q701 IC701
Q1001 IC1005 IC1002 IC761 Q224 Q225 Q508 Q509 Q510 IC251
Q1005 Q1006 IC1004 IC1003 Q1207 Q1205 Q1203 Q1201 Q761 IC506 Q270 Q272 Q27
Q1010 Q1007 Q1208 Q1206 Q1204 Q1202 Q103 Q104 Q507 Q512 Q271
IC1602 IC1603 IC1601 Q1604 Q1212 Q1211 Q1210 Q1209 Q105 Q106 Q273 Q108
Q854 Q1602 Q1603 Q762 Q502 IC503 Q122 Q114 Q112 IC101
Q855 Q1605 IC801 IC504 Q511 Q111 Q101
Q853 Q852 Q856 Q501 IC502 Q1103 Q113 Q110 Q115 Q109 Q1
Q858 Q857 Q851 IC501 Q505 Q504 Q503 Q1104 IC1101 Q1101 Q803
IC851 Q506 Q1102 Q802 Q80

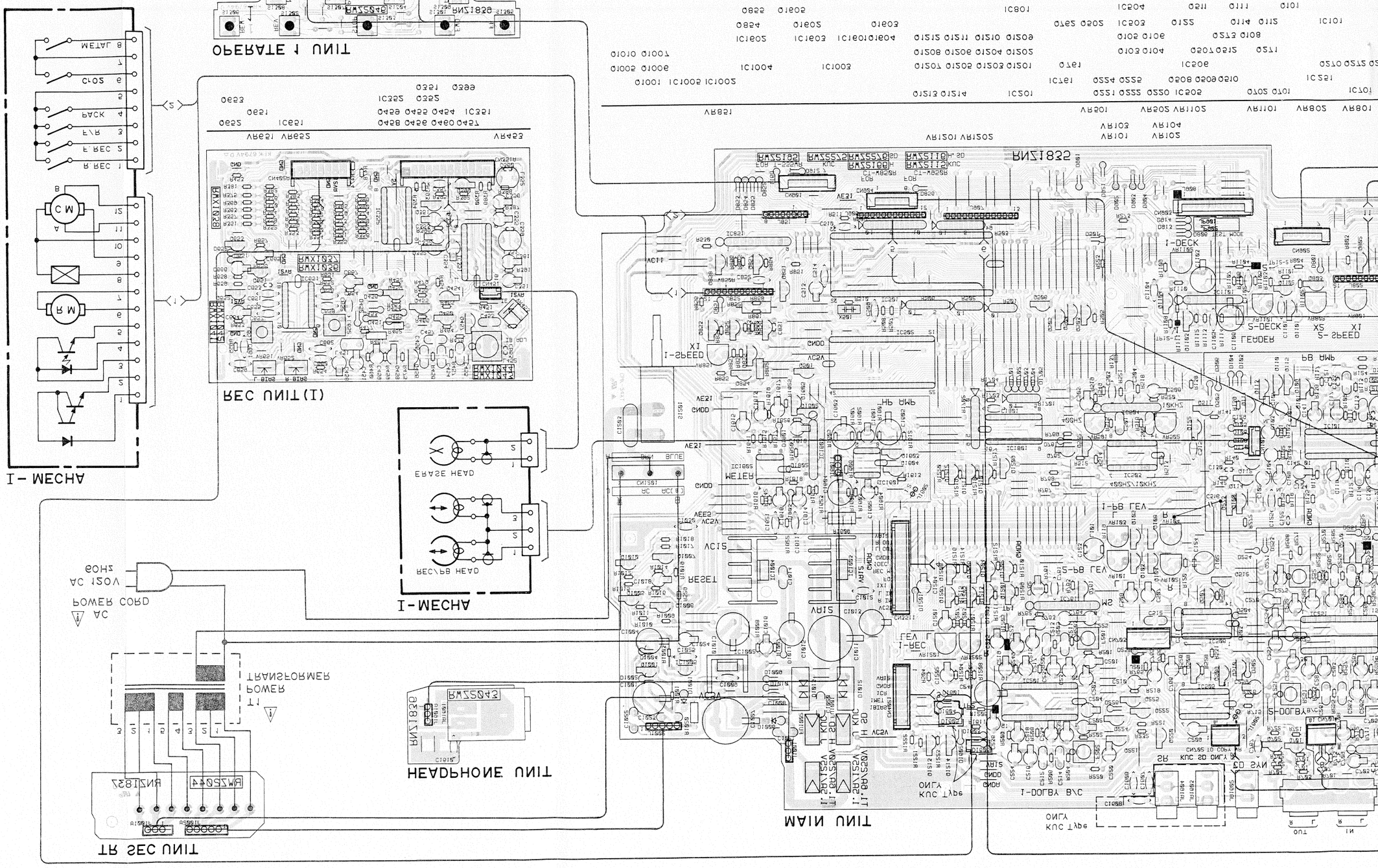



| P.C.B. pattern diagram indication | Corresponding part symbol | Part name |
|---|---|---|
| | | Transistor |
| | | FET |
| | | Diode |
| | | Zenner diode |
| | | LED |
| | | Varactor |
| | | Tact switch |
| | | Inductor |
| | | Coil |
| | | Transformer |
| | | Filter |
| | | Ceramic capacitor |
| | | Mylar capacitor |
| | | Styrol capacitor |
| | | Electrolytic capacitor (Non polarized) |
| | | Electrolytic capacitor (Noiseless) |
| | | Electrolytic capacitor (Polarized) |
| | | Electrolytic capacitor (Polarized) |
| | | Power capacitor |
| | | Semi-fixed resistor |
| | | Resistor array |
| | | Resistor |
| | | Resonator |
| | | Thermistor |

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

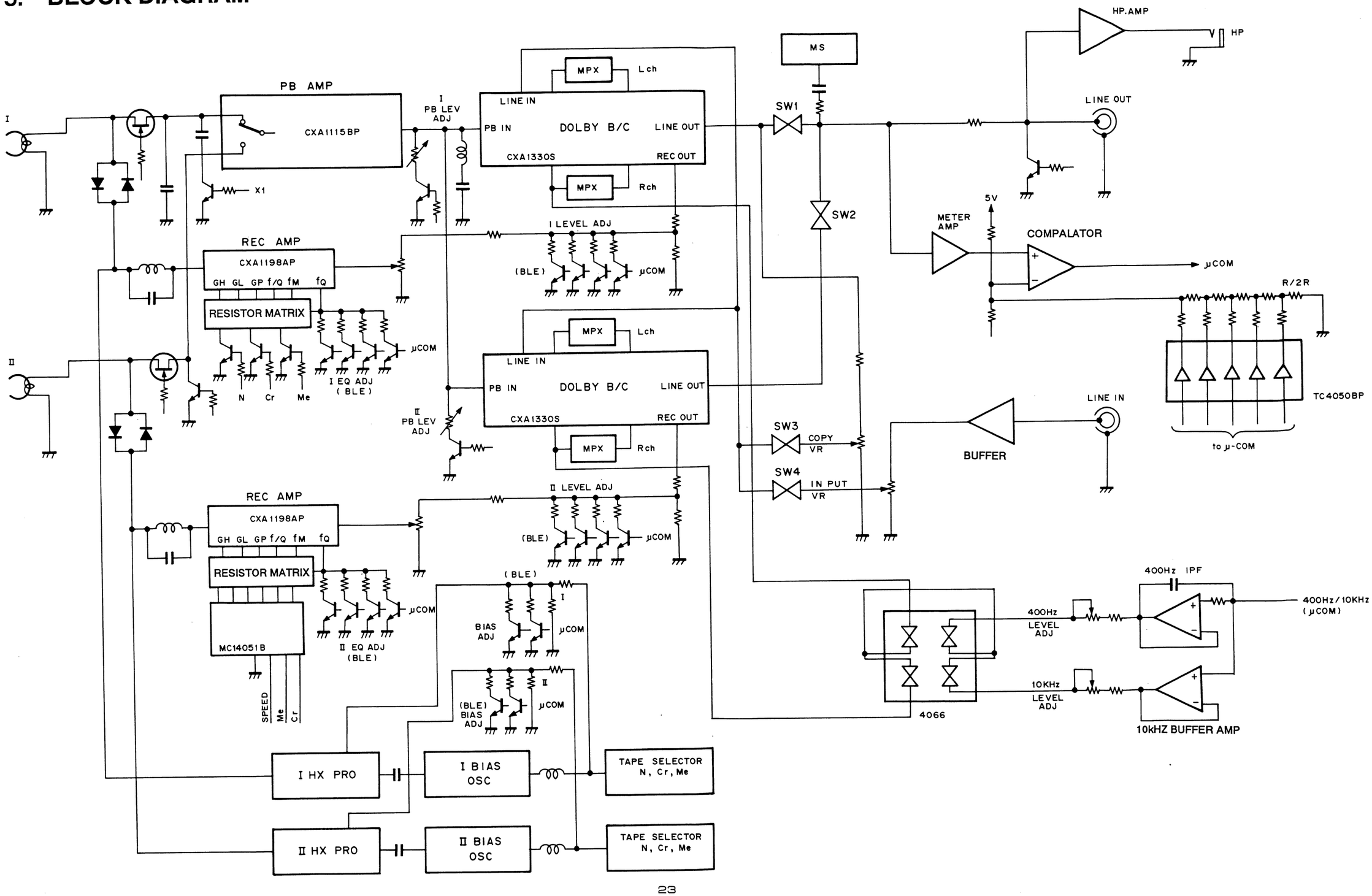

DISPLAY UNIT
SD Type ONLY
RW2204
RW2104
REC UNIT (II)
II - MECHA
REC/PB HEAD
ERASE HEAD
OPERATE 2 UNIT
RW2204
RN2184
S-DOLBY
S-REC LEV
PB AMP
LEADER
S-DECK
S-SPEED
MPX
SYN
OUT
IN
1 R REC
2 F REC
3 F/R
4 PACK
5
6 CROZ
7
8 METAL
R M
C M

# A. P.C. BOARDS CONNECTION DIAGRAM




● View from soldering side

# 5. BLOCK DIAGRAM



# 6. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10¹ → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4SR 5 6 2 1 F

| Mark | No. | Description | Part No. |
|---|---|---|---|
| **REC (1) UNIT** | | | |
| **SEMICONDUCTORS** | | | |
| | IC351 | REC EQUALIZER IC | CXA1198AP-A |
| | IC352 | LOGIC IC | MC14051B |
| | IC651 | DOLBY HX PRO IC | UPC1297CA |
| | Q351, 352 | TRANSISTOR | 2SC3311A |
| | Q399 | TRANSISTOR | XDC124ES |
| | Q454, 455 | TRANSISTOR | 2SC3311A |
| | Q456-458 | TRANSISTOR | 2SC3243 |
| | Q459, 460 | TRANSISTOR | 2SB1238X |
| | Q651, 652 | TRANSISTOR | 2SA1309A |
| | Q653 | TRANSISTOR | XDC124ES |
| | D451 | DIODE | 1SS254 |
| | D452 | DIODE | 1SS252 |
| | D453-456 | DIODE | 1SS254 |
| | D651, 652 | DIODE | 1SS254 |
| **COILS/TRANSFORMERS** | | | |
| | L351, 352 | COIL | RTF1004 |
| | L451 | RADIAL INDUCTOR | LFA121K |
| | L452 | COIL | RTD1022 |
| | L651, 652 | COIL | RTD1046 |
| **CAPACITORS** | | | |
| | C351, 352 | ELECTR. CAPACITOR | CEAS471M10 |
| | C353-356 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C357 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C358 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C359, 360 | AXIAL CAPACITOR | CKPUYB221K50 |
| | C361 | ELECTR. CAPACITOR | CEAS470M16 |
| | C451 | ELECTR. CAPACITOR | CEAS330M35 |
| | C453 | CAPACITOR | CQPA682J100 |
| | C454 | AUDIO FILM CAPACITOR | CFTXA223J50 |
| | C455 | AUDIO FILM CAPACITOR | CFTXA682J50 |
| | C456, 457 | AUDIO FILM CAPACITOR | CFTXA332J50 |
| | C458 | ELECTR. CAPACITOR | CEAS330M35 |
| | C459 | ELECTR. CAPACITOR | CEAS100M50 |
| | C651, 652 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| | C653, 654 | AXIAL CAPACITOR | CKPUYB821K50 |
| | C655, 656 | AUDIO FILM CAPACITOR | CFTXA223J50 |
| | C657, 658 | CERAMIC CAPACITOR | CGCYX473K25 |
| | C659, 660 | CERAMIC CAPACITOR | CCCSL101K500 |
| | C661, 662 | CERAMIC CAPACITOR | RCG1005 |
| | C663 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C664 | ELECTR. CAPACITOR | CEASR10M50 |
| | C665 | ELECTR. CAPACITOR | CEAS100M50 |
| | C666 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C667 | ELECTR. CAPACITOR | CEAS100M50 |
| **RESISTORS** | | | |
| | R351-356 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R363-368 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R375-380 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R387-396 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R451 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R452-457 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R459, 460 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R461, 462 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R463-466 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R474-479 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R651-659 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | VR453 | VARIABLE RESISTOR | RCP1013 |
| | VR651, 652 | VR | VRTB6HS223 |
| **OTHERS** | | | |
| | CN351 | | S12B-XH-A-1 |
| | CN402 | | S8B-XH-A-1 |
| **REC (2) UNIT** | | | |
| **SEMICONDUCTORS** | | | |
| | IC351 | REC EQUALIZER IC | CXA1198AP-A |
| | IC352 | LOGIC IC | MC14051B |
| | IC651 | DOLBY HX PRO IC | UPC1297CA |
| | Q351, 352 | TRANSISTOR | 2SC3311A |
| | Q399 | TRANSISTOR | XDC124ES |
| | Q454, 455 | TRANSISTOR | 2SC3311A |
| | Q456-458 | TRANSISTOR | 2SC3243 |
| | Q459, 460 | TRANSISTOR | 2SB1238X |
| | Q651, 652 | TRANSISTOR | 2SA1309A |
| | Q653 | TRANSISTOR | XDC124ES |
| | D451 | DIODE | 1SS254 |
| | D452 | DIODE | 1SS252 |
| | D453-456 | DIODE | 1SS254 |
| | D651, 652 | DIODE | 1SS254 |
| **COILS/TRANSFORMERS** | | | |
| | L351, 352 | COIL | RTF1004 |
| | L451 | RADIAL INDUCTOR | LFA121K |
| | L452 | COIL | RTD1022 |
| | L651, 652 | COIL | RTD1046 |
| **CAPACITORS** | | | |
| | C351, 352 | ELECTR. CAPACITOR | CEAS471M10 |
| | C353-356 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C357 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C358 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C359, 360 | AXIAL CAPACITOR | CKPUYB221K50 |
| | C361 | ELECTR. CAPACITOR | CEAS470M16 |
| | C451 | ELECTR. CAPACITOR | CEAS330M35 |
| | C453 | CAPACITOR | CQPA682J100 |
| | C454 | AUDIO FILM CAPACITOR | CFTXA223J50 |
| | C455 | AUDIO FILM CAPACITOR | CFTXA682J50 |
| | C456, 457 | AUDIO FILM CAPACITOR | CFTXA332J50 |
| | C458 | ELECTR. CAPACITOR | CEAS330M35 |
| | C459 | ELECTR. CAPACITOR | CEAS100M50 |
| | C651, 652 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| | C653, 654 | AXIAL CAPACITOR | CKPUYB821K50 |
| | C655, 656 | AUDIO FILM CAPACITOR | CFTXA223J50 |
| | C657, 658 | CERAMIC CAPACITOR | CGCYX473K25 |
| | C659, 660 | CERAMIC CAPACITOR | CCCSL101K500 |
| | C661, 662 | CERAMIC CAPACITOR | RCG1005 |
| | C663 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C664 | ELECTR. CAPACITOR | CEASR10M50 |
| | C665 | ELECTR. CAPACITOR | CEAS100M50 |
| | C666 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C667 | ELECTR. CAPACITOR | CEAS100M50 |
| **RESISTORS** | | | |
| | R351-396 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R451 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R452-457 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R459, 460 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R461, 462 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R463-466 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R474-479 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R651-659 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | VR453 | VARIABLE RESISTOR | RCP1013 |
| | VR651, 652 | VR | VRTB6HS223 |
| **OTHERS** | | | |
| | CN351 | | S12B-XH-A-1 |
| | CN402 | | S8B-XH-A-1 |
| **HEADPHONE UNIT** | | | |
| **CAPACITORS** | | | |
| | C1610 | CERAMIC CAPACITOR | CKCYF473Z50 |
| **OTHERS** | | | |
| | JA1601 | JACK | RKN1002 |
| **TR SEC UNIT** | | | |
| There is no supply part in this unit. | | | |
| **OPERATE 1 UNIT** | | | |
| **SWITCHES** | | | |
| | S1301-1309 | SWITCH | RSG1033 |
| **OPERATE 2 UNIT** | | | |
| **SWITCHES** | | | |
| | S1401-1409 | SWITCH | RSG1033 |
| **MAIN UNIT** | | | |
| **SEMICONDUCTORS** | | | |
| | IC101 | PB-EQ AMP IC | CXA1115BP |
| | IC201 | DOLBY B/C IC | CXA1330S |
| | IC251 | DOLBY B/C IC | CXA1330S |
| | IC501 | | PD4296A |
| | IC502 | FL STATIC DRIVER IC | LC7570 |
| | IC503 | LOGIC IC | TC4066BP |
| | IC504 | IC | BA15218N |
| | IC505, 506 | LOGIC IC | TC4066BP |
| | IC701 | IC | BA15218N |
| | IC761 | IC | BA335 |
| | IC801 | IC | BA6218 |
| | IC851 | IC | BA6218 |
| ⚠ | IC1002 | REGULATOR IC | NJM78M05FA |
| ⚠ | IC1003, 1004 | REGULATOR IC | NJM7812FA |
| ⚠ | IC1005 | REGULATOR IC | NJM79L05A |
| | IC1101 | DUAL-COMPARATOR IC | M5233L |
| | IC1601, 1602 | OP-AMP IC | BA15218 |
| | IC1603 | DUAL-COMPARATOR IC | M5233L |
| | IC1801 | CMOS LOGIC IC | TC4050BP |
| | Q101, 102 | TRANSISTOR | XDC124ES |
| | Q103-106 | DIGITAL TRANSISTOR | DTC114TS |
| | Q107-109 | TRANSISTOR | XDC124ES |
| | Q110 | DIGITAL TRANSISTOR | XDA114ES |
| | Q111, 112 | N-FET | 2SK373 |
| | Q113, 114 | TRANSISTOR | 2SC3311A |
| | Q115 | TRANSISTOR | XDC124ES |
| | Q116 | DIGITAL TRANSISTOR | XDA114ES |
| | Q117, 118 | N-FET | 2SK373 |
| | Q119, 120 | TRANSISTOR | 2SC3311A |
| | Q121, 122 | TRANSISTOR | XDC124ES |
| | Q220 | DIGITAL TRANSISTOR | XDA114ES |
| | Q221, 222 | TRANSISTOR | XDC124ES |
| | Q224 | DIGITAL TRANSISTOR | XDC144ES |
| | Q225 | TRANSISTOR | XDC124ES |
| | Q270 | DIGITAL TRANSISTOR | XDA114ES |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | Q271-273 | TRANSISTOR | XDC124ES |
| | Q274 | DIGITAL TRANSISTOR | XDC144ES |
| | Q275 | TRANSISTOR | XDC124ES |
| | Q501-506 | TRANSISTOR | XDC124ES |
| | Q507 | DIGITAL TRANSISTOR | XDC114ES |
| | Q508 | DIGITAL TRANSISTOR | DTA114TS |
| | Q509 | TRANSISTOR | XDC124ES |
| | Q510 | TRANSISTOR | 2SA1309A |
| | Q511 | TRANSISTOR | XDC124ES |
| | Q512 | DIGITAL TRANSISTOR | XDA114ES |
| | Q701, 702 | TRANSISTOR | 2SD1302 |
| | Q761 | DIGITAL TRANSISTOR | XDC114ES |
| | Q762 | DIGITAL TRANSISTOR | DTA114TS |
| | Q801-803 | TRANSISTOR | 2SD1858X |
| | Q804 | DIGITAL TRANSISTOR | DTA115TS |
| | Q805 | TRANSISTOR | XDC124ES |
| | Q806 | TRANSISTOR | 2SC3311A |
| | Q807 | TRANSISTOR | 2SC3246 |
| | Q808 | DIGITAL TRANSISTOR | DTC114TS |
| | Q851-853 | TRANSISTOR | 2SD1858X |
| | Q854 | DIGITAL TRANSISTOR | DTA115TS |
| | Q855 | TRANSISTOR | XDC124ES |
| | Q856 | TRANSISTOR | 2SC3311A |
| | Q857 | TRANSISTOR | 2SC3246 |
| | Q858 | DIGITAL TRANSISTOR | DTC114TS |
| ⚠ | Q1001 | TRANSISTOR | 2SA1283 |
| | Q1005 | TRANSISTOR | 2SA1309A |
| | Q1006, 1007 | TRANSISTOR | 2SC3311A |
| | Q1010 | TRANSISTOR | 2SA1309A |
| | Q1101-1104 | TRANSISTOR | 2SC3311A |
| | Q1201-1214 | TRANSISTOR | XDC124ES |
| | Q1251-1264 | TRANSISTOR | XDC124ES |
| | Q1602 | DIGITAL TRANSISTOR | DTC114TS |
| | Q1603, 1604 | TRANSISTOR | 2SC3311A |
| | Q1605 | DIGITAL TRANSISTOR | DTC114TS |
| | D101-106 | DIODE | 1SS254 |
| | D109, 110 | DIODE | 1SS254 |
| | D113-116 | DIODE | 1SS254 |
| | D119, 120 | DIODE | 1SS254 |
| | D226 | DIODE | 1SS254 |
| | D251-256 | DIODE | 1SS254 |
| | D501 | ZENER DIODE | MTZJ9. 1A |
| | D502-507 | DIODE | 1SS254 |
| | D761 | ZENER DIODE | MTZJ4. 3B |
| | D801 | DIODE | 1SS252 |
| | D802-806 | DIODE | 1SS254 |
| | D851 | DIODE | 1SS252 |
| | D852-856 | DIODE | 1SS254 |
| | D901-904 | DIODE | 1SS254 |
| | D911-914 | DIODE | 1SS254 |
| | D921 | DIODE | 1SS254 |
| ⚠ | D1001 | DIODE | 1SR35-100AVL |
| ⚠ | D1002 | ZENER DIODE | MTZJ33B |
| | D1004 | ZENER DIODE | MTZJ5. 1B |
| ⚠ | D1006 | DIODE | 1SR35-100AVL |
| | D1009-1011 | DIODE | 1SS254 |
| ⚠ | D1012 | POWER DIODE | 1B2Z1-LC2 |
| ⚠ | D1013 | POWER DIODE | 1B2C1-LC2 |
| | D1201 | DIODE | 1SS254 |
| | D1251 | DIODE | 1SS254 |
| | D1601-1606 | DIODE | 1SS254 |
| | D1701-1705 | DIODE | 1SS254 |
| | D1801-1803 | DIODE | 1SS254 |
| **SWITCHES** | | | |
| | S251 | | RSH1022 |
| ⚠ | S1201 | SWITCH | RSA-063 |
| **COILS/TRANSFORMERS** | | | |
| | L101, 102 | COIL | RTF1099 |
| | F201, 202 | FILTER | ATF-210 |
| | F251, 252 | FILTER | ATF-210 |
| **CAPACITORS** | | | |
| | C101, 102 | PL. STYRENE CAPACITOR | CQSF102J50 |
| | C103, 104 | PL. STYRENE CAPACITOR | CQSF221J50 |
| | C105, 106 | PL. STYRENE CAPACITOR | CQSF122J50 |
| | C107-110 | ELECTR. CAPACITOR | RCH1007 |
| | C111, 112 | ELECTR. CAPACITOR | RCH1008 |
| | C113, 114 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| | C117, 118 | ELECTR. CAPACITOR | CEYA4R7M50 |
| | C121, 122 | AXIAL CAPACITOR | CKPUYB221K50 |
| | C123, 124 | AXIAL CAPACITOR | CKPUYB391K50 |
| | C125 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C129-132 | AXIAL CERAMIC C. | CCPUSL100J50 |
| | C133, 134 | AXIAL CAPACITOR | CKPUYB681K50 |
| | C135-138 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C141, 142 | ELECTR. CAPACITOR | CEYA470M16 |
| | C201-204 | ELECTR. CAPACITOR | CEYA010M50 |
| | C209, 210 | ELECTR. CAPACITOR | CEYA4R7M50 |
| | C211-214 | AUDIO FILM CAPACITOR | CFTXA222J50 |
| | C215, 216 | ELECTR. CAPACITOR | CEYAR22M50 |
| | C217, 218 | ELECTR. CAPACITOR | CEYAR33M50 |
| | C219, 220 | ELECTR. CAPACITOR | CEYA100M50 |
| | C223, 224 | ELECTR. CAPACITOR | CEYAR33M50 |
| | C225 | ELECTR. CAPACITOR | CEAS010M50 |
| | C231, 232 | ELECTR. CAPACITOR | CEYA100M50 |
| | C233, 234 | ELECTR. CAPACITOR | CEYA010M50 |
| | C235, 236 | ELECTR. CAPACITOR | CEYA330M16 |
| | C241 | ELECTR. CAPACITOR | CEYA101M16 |
| | C251-254 | ELECTR. CAPACITOR | CEYA010M50 |
| | C259, 260 | ELECTR. CAPACITOR | CEYA4R7M50 |
| | C261-264 | AUDIO FILM CAPACITOR | CFTXA222J50 |
| | C265, 266 | ELECTR. CAPACITOR | CEYAR22M50 |
| | C267, 268 | ELECTR. CAPACITOR | CEYAR33M50 |
| | C269, 270 | ELECTR. CAPACITOR | CEYA100M50 |
| | C273, 274 | ELECTR. CAPACITOR | CEYAR33M50 |
| | C275 | ELECTR. CAPACITOR | CEAS010M50 |
| | C281, 282 | ELECTR. CAPACITOR | CEYA100M50 |
| | C283, 284 | ELECTR. CAPACITOR | CEYA010M50 |
| | C285, 286 | ELECTR. CAPACITOR | CEYA330M16 |
| | C291 | ELECTR. CAPACITOR | CEYA101M16 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | C501, 502 | AUDIO FILM CAPACITOR | CFTXA223J50 |
| | C503 | CERAMIC CAPACITOR | CGCYX104K25 |
| | C504 | AUDIO FILM CAPACITOR | CFTXA103J50 |
| | C505, 506 | ELECTR. CAPACITOR | CEAS010M50 |
| | C507, 508 | ELECTR. CAPACITOR | CEAS100M50 |
| | C509, 510 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C511, 512 | AUDIO FILM CAPACITOR | CFTXA332J50 |
| | C513 | ELECTR. CAPACITOR | CEAS470M16 |
| | C514, 515 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C516 | CERAMIC CAPACITOR | CKDYF103Z50 |
| | C701, 702 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C703, 704 | ELECTR. CAPACITOR | CEYA010M50 |
| | C705 | ELECTR. CAPACITOR | CEYA470M16 |
| | C706 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C707, 708 | ELECTR. CAPACITOR | CEYA100M50 |
| | C709, 710 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C711 | ELECTR. CAPACITOR | CEYA470M16 |
| | C712, 713 | AXIAL CAPACITOR | CKPUYB101K50 |
| | C761 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C762, 763 | ELECTR. CAPACITOR | CEASR10M50 |
| | C764 | ELECTR. CAPACITOR | CEASR47M50 |
| | C765, 766 | ELECTR. CAPACITOR | CEASR10M50 |
| | C767 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C801 | CERAMIC CAPACITOR | CKPUYY103M16 |
| | C802 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C851 | CERAMIC CAPACITOR | CKPUYY103M16 |
| | C852 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1001 | ELECTR. CAPACITOR | CEAS471M50 |
| | C1004 | ELECTR. CAPACITOR | CEAS330M35 |
| | C1007 | ELECTR. CAPACITOR | CEAS472M16 |
| | C1008 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1009 | AUDIO FILM CAPACITOR | CFTXA473J50 |
| | C1010 | ELECTR. CAPACITOR | CEAS222M16 |
| | C1011 | ELECTR. CAPACITOR | RCH1060 |
| | C1012 | CERAMIC CAPACITOR | CFTXA103J50 |
| | C1013 | ELECTR. CAPACITOR | CEZA471M16 |
| | C1014 | AUDIO FILM CAPACITOR | CFTXA104J50 |
| | C1015 | ELECTR. CAPACITOR | CEAS331M16 |
| | C1016 | ELECTR. CAPACITOR | CEAS220M50 |
| | C1018 | ELECTR. CAPACITOR | CEAS100M50 |
| | C1020-1023 | AUDIO FILM CAPACITOR | CFTXA473J50 |
| | C1024 | ELECTR. CAPACITOR | CEAS470M16 |
| | C1025 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1030 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1101, 1102 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C1103 | ELECTR. CAPACITOR | CEAS330M50 |
| | C1104, 1105 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C1106 | ELECTR. CAPACITOR | CEAS330M50 |
| | C1201, 1202 | ELECTR. CAPACITOR | CEYA010M50 |
| ⚠ | C1203 | CAPACITOR (CERAMIC) | RCG-009 |
| | C1204 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C1251, 1252 | ELECTR. CAPACITOR | CEYA010M50 |
| | C1254 | ELECTR. CAPACITOR | CEAS4R7M50 |
| | C1601, 1602 | ELECTR. CAPACITOR | CEYAR22M50 |
| | C1603, 1604 | ELECTR. CAPACITOR | CEYA101M16 |
| | C1605 | ELECTR. CAPACITOR | CEYA331M16 |
| | C1606 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | C1607, 1608 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1611 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1613 | ELECTR. CAPACITOR | CEAS331M16 |
| | C1614 | ELECTR. CAPACITOR | CEAS330M35 |
| | C1615, 1616 | ELECTR. CAPACITOR | CEAS100M50 |
| | C1617, 1618 | ELECTR. CAPACITOR | CEASR47M50 |
| | C1621 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C1801 | CERAMIC CAPACITOR | CKCYF473Z50 |

**RESISTORS**

| | | | |
|---|---|---|---|
| | R101-114 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R117-121 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R123-125 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R135, 136 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R137 | METAL OXIDE RESISTOR | RS1LMF□□□J |
| | R138-142 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R145 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R147-150 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R201-209 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R218 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R220, 221 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R223 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R232 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R249 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R251-259 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R268 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R270-273 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R282 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R299 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R501, 502 | RESISTOR ARRAY(10K) | RA4T□□□J |
| | R503 | RESISTOR ARRAY(68K) | RA8T□□□J |
| | R504, 505 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R506 | RESISTOR ARRAY(22K) | RA7T□□□J |
| | R507, 508 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R509 | RESISTOR ARRAY(68K) | RA11T□□□J |
| | R510-516 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R518-521 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R525, 526 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R528-531 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R549 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R701-704 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R707-716 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R721, 722 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R761-763 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R765-769 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R801 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R802 | METAL OXIDE RESISTOR | RS2LMF□□□J |
| | R803-805 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R807, 808 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R810-812 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R814-816 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R818 | CARBONFILM RESISTOR | RD1/6PM□□□J |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | R851 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R852 | METAL OXIDE RESISTOR | RS2LMF□□□J |
| | R853-858 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R860, 861 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R862 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R864-866 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R868 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1001 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1003 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1007-1012 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1014-1019 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| ⚠ | R1020 | FUSIBLE RESISTOR | RFA1/4L□□□J |
| | R1101-1103 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1104 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1105-1110 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1111 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1112-1114 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1201-1204 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1205, 1206 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1207-1223 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1251-1254 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1255, 1256 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R1257-1273 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1601-1608 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1609 | METAL OXIDE RESISTOR | RS2LMF□□□J |
| | R1611-1613 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1615-1623 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1625, 1626 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1641, 1642 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R1701 | RESISTOR ARRAY(22K) | RA5T□□□J |
| | R1702 | LADDER RESISTOR | RCX1020 |
| | R1703, 1704 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | VR101-104 | VR | RCP1046 |
| | VR501, 502 | VR | RCP1046 |
| | VR801 | VR | VRTG6VS223 |
| | VR802 | VR | RCP1054 |
| | VR851 | VR | VRTG6VS223 |
| | VR1101, 1102 | VR | RCP1046 |
| | VR1201, 1202 | VR | RCP1046 |
| | VR1251, 1252 | VR | RCP1046 |
| **OTHERS** | | | |
| | CN3511, 3512 | | 12JQ-BT |
| | CN4021, 4022 | | 8JQ-BT |
| | JA701 | 4P PIN JACK | RKB1003 |
| | JA1602 | JACK | RKN1014 |
| | JA1603, 1604 | JACK | RKN1004 |
| | X501 | CERAMIC RESONATOR | VSS1014 |

| Mark | No. | Description | Part No. |
|---|---|---|---|

## DISPLAY UNIT

### SEMICONDUCTORS

| | | |
|---|---|---|
| Q1501, 1502 | DIGITAL TRANSISTOR | DTA114TS |
| D1501-1506 | DIODE | 1SS254 |
| D1507 | DIODE | 1SS252 |
| D1510 | DIODE | 1SS254 |

### SWITCHES

| | | |
|---|---|---|
| S1501-1509 | SWITCH | RSG1034 |
| S1510, 1511 | SWITCH | RSH1014 |
| S1512, 1513 | | RSH1024 |

### CAPACITORS

| | | |
|---|---|---|
| C1502 | ELECTR. CAPACITOR | CEAS2R2M50 |

### RESISTORS

| | | |
|---|---|---|
| R1501-1506 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| R1508-1512 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| R1514 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| VR1501 | VARIABLE RESISTOR | RCV1057 |
| VR1502 | | RCV1071 |

### OTHERS

| | | |
|---|---|---|
| CN906 | | BTMK12S-1S |
| V1501 | | RAW1080 |

# 7. ADJUSTMENTS

## 7.1 MECHANICAL ADJUSTMENT

- This adjustment should be performed in the test mode.
- Entering the test mode.

Short JP901 and JP902 briefly. (The unit enters the TEST MODE.)

| Mode | Operation | Display |
|---|---|---|
| Side I<br>Double speed play | Double speed PLAY is selected while the FAST key (Side I or II) is held down during PLAY mode of side I. (Before selecting another mode, press the STOP key first.) | C-03 |
| Side II<br>Double speed play | Double speed PLAY is selected while the FAST key (Side I or II) is held down during PLAY mode of Side II. (Before selecting another mode, press the STOP key first.) | C-04 |

To release the TEST MODE, press the side I COUNTER RESET key or turn off the unit.

1. Tape Speed Adjustment and Check

| No. | Deck | Mode | Test tape | Adjusting points | Specifications/Ratings (playback frequency) | Remarks |
|---|---|---|---|---|---|---|
| 1 | I | Normal speed PLAY | STD-301<br>(3 kHz) | After playing back for 1 minute. | | |
| 2 | | Double speed PLAY | | check | 6000 Hz ± 600 Hz | |
| 3 | | Normal speed PLAY | | VR851 | 3000 Hz ± 5 Hz | |
| 4 | II | | | After checking, play back on deck II. | | |
| 5 | | Double speed PLAY | | After playing back for 1 minute. | | |
| 6 | | Normal speed PLAY | | VR802 | Within ± 10 Hz of the value measured in step 2 (deck I) | |
| 7 | | | | After checking. | | |
| 8 | | | | VR801 | 3000 Hz ± 5 Hz | |

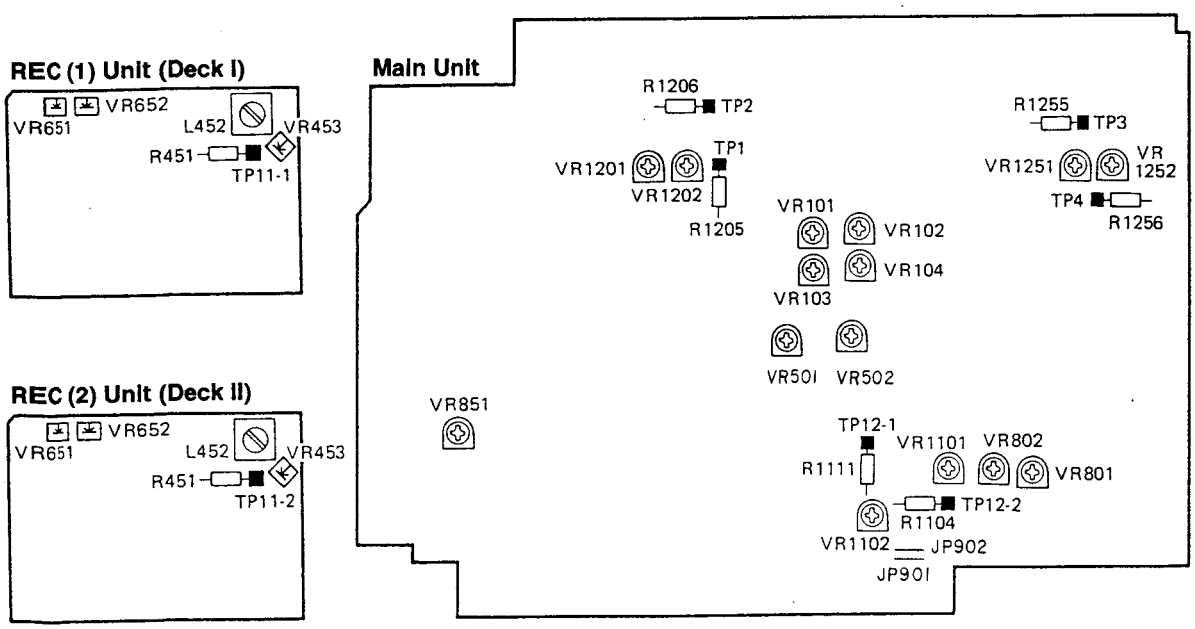



Fig. 7-1 Adjusting points

## 7.2 ELECTRICAL ADJUSTMENTS

### Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBv=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

### Test Tapes

| | |
|---|---|
| STD-331B | : Playback adjustments (See Fig. 7-2) |
| STD-630 | : NORMAL blank tape |
| STD-620 | : $CrO_2$ blank tape |
| STD-610 | : METAL blank tape |

### List of Adjustments

#### Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.

#### Recording sections

1. Bias oscillator adjustment.
2. Erase current adjustment.
3. Recording bias adjustment.
4. Recording level adjustment.
5. Level meter check.
6. Leader tape detection operation adjustment.
7. AUTO BLE adjustment.

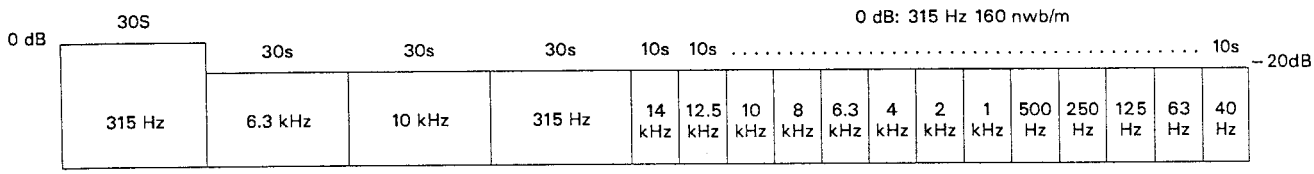



Fig. 7-2 Constants of the test tape STD-331B

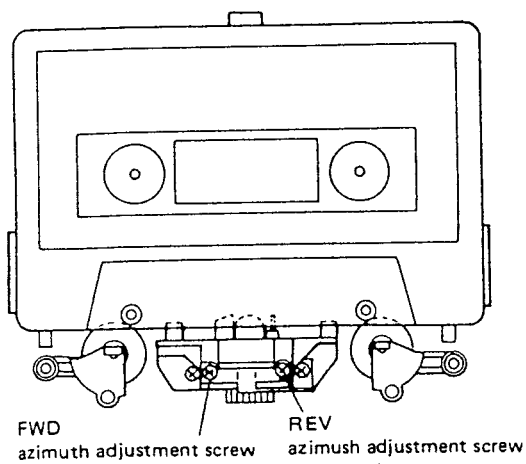



Fig. 7-3 Head azimuth adjustment

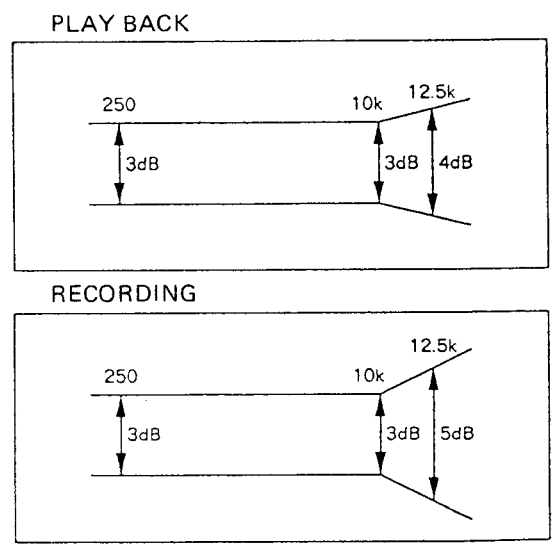



Fig. 7-4 Frequency response zone

# PLAYBACK SECTION

## 1. Head Azimuth Adjustment

- Turn VR101, 102 (Deck I) or VR103, 104 (Deck II) to mechanical center positions.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 10 kHz/–20 dB section of STD–331B test tape. | Head azimuth adjustment screw. (See Fig. 7–3) | LINE OUT | Maximum playback signal level. | |
| 2. | STOP | Lock the screw with screw lock after completing adjustment. | | | | |

## 2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 315 Hz/0 dB section of the STD–331B test tape. | Deck I | VR103 (Lch)<br>VR104 (Rch) | TP. 1 (Lch)<br>TP. 2 (Rch) | –10.7 dBv | |
| | | | Deck II | VR101 (Lch)<br>VR102 (Rch) | TP. 3 (Lch)<br>TP. 4 (Rch) | | |

# RECORDING SECTION

## 1. Bias Oscillator Adjustment

- Adjust the bias oscillator with checks set to recording mode simultaneously. ← (Double R/P only)

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC | Load the STD–610 test tape with no input signal. | Deck I | L452 | TP. 11–1 | 105 kHz ± 0.3 kHz | |
| | | | Deck II | L452 | TP. 11–2 | | |

## 2. Erase Current Adjustment

- Adjust the bias oscillator with decks I and II set to recording mode independently. ← (Double R/P only)

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC | Load the STD–610 test tape with no input signal. | Deck I | VR453 | TP. 11–1 | 180 mV AC | |
| | | | Deck II | VR453 | TP. 11–2 | | |

## 3. Recording Bias Adjustment

- Adjust the bias oscillator with decks I and II set to recording mode independently. ← (Double R/P only)
- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Set the TAPE SELECTOR switch to the NORM position. | | | | | |
| 2. | REC | Record the 315 Hz and 6.3 kHz signals at –20 dBv input level and playback. | Deck I | VR651 (Lch)<br>VR652 (Rch) | LINE OUT | Repeatedly record, playback and adjust so that the plyaback level of 6.3 kHz signal becomes +0.5 dB ± 0.5 dB when compared with the 315 Hz signal. | |
| | | | Deck II | VR651 (Lch)<br>VR652 (Rch) | | | |

## 4. Recording Level Adjustment

- Adjust the bias oscillator with decks I and II set to recording mode independently. ← (Double R/P only)

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Set the TAPE SELECTOR switch to the NORM position. | | | | | |
| 2. | REC/ PAUSE | Apply a 315 Hz/0 dBv signal to the line input terminals, load the STD-630 test tape. | REC level control volume | | TP. 1 (Lch) TP. 2 (Rch) | -11.2 dBv | |
| 3 | STOP | Set the DOLBY NR switch to the ON position. (DOLBY B) | | | | | |
| 4. | REC/ PLAY | Record the above signal onto the STD-630 test tape, and playback. | Deck I | VR1201 (Lch) VR1202 (Rch) | TP. 1 (Lch) TP. 2 (Rch) | Repeatedly record, playback and adjust so that the playback signal level becomes -11.2 dB. | |
| | | | Deck II | VR1251 (Lch) VR1252 (Rch) | | | |
| 5. | STOP | Set the TAPE SELECTOR switch to the CrO2 position. | | | | | |
| 6. | REC/ PLAY | Record the above signal onto the STD-620 test tape, and playback. | Check | | TP. 1 (Lch) TP. 2 (Rch) | -11.2 dBv ± 1.5 dB | |
| 7. | STOP | Set the TAPE SELECTOR switch to the METAL position. | | | | | |
| 8. | REC/ PLAY | Record the above signal onto the STD-610 test tape, and playback. | Check | | TP. 1 (Lch) TP. 2 (Rch) | -11.2 dBv ± 1.5 dB | |

## 5. Level Meter Check

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Apply a 315 Hz/-10 dBv (316 mV) signal to the Line Input terminals. | REC level control volume | TP. 1 (Lch) TP. 2 (Rch) | Check that the level meters "0 dB" light up within -11.2 dBv ± 2 dB of the signal output level. | |

## 6. Leader Tape Detection Operation Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1. | PLAY | No input-load an empty cassette half. | Deck I | VR1102 | Deck I | TP. 12-1 | $1.0V \pm \frac{0}{0.1}$ V (DC) | |
| | | | Deck II | VR1102 | Deck II | TP. 12-2 | | |
| 2. | Check that the leader tape detection operation is correctly performed (inboth FWD and REV directions when in endless reverse mode). | | | | | | | |

## 7. AUTO BLE Adjustment

- BLE adjustment must be performed after all other adjustments are completed.
- This adjustment should be performed in the test mode.
- Entering the test mode. (Refer to page 30.)

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | – | Set to the test mode. | – | – | – | |
| 2. | | Press the PARALLEL REC key on the front panel. | Level meter | VR501 | Adjust so that 0 dB lights on the level meter. | 400 Hz adjustment |
| 3. | | Press the NORMAL SPEED key. | | VR502 | Adjust so that 0 dB lights on the level meter. | 10 kHz adjustment |

# 7. RÉGLAGES

## 7.1 RÉGLAGE MECANIQUE

- Ce réglage doit être effectué dans le mode d'essai.
- Passage au mode d'essai.

Court-circuiter brièvement JP901 et JP902. (L'appareil passe dans le MODE D'ESSAI).

| Mode | Opération | Indication |
|---|---|---|
| Lecture (PLAY) double vitesse pour le côté I | La lecture double vitesse est sélectionnée lorsque la touche FAST (côté I ou II) est maintenue enfoncée pendant le mode lecture (PLAY) du côté I. (Avant de sélectionner un autre mode, appuyer tout d'abord sur la touche STOP). | C-03 |
| Lecture (PLAY) double vitesse pour le côté II | La lecture double vitesse est sélectionnée lorsque la touche FAST (côté I ou II) est maintenue enfoncée pendant le mode lecture (PLAY) du côté II. (Avant de sélectionner un autre mode, appuyer tout d'abord sur la touche STOP). | C-04 |

Pour sortir du MODE D'ESSAI, appuyer sur la touche COUNTER RESET du côté I ou mettre l'appareil hors circuit.

1. Réglage et vérification de la vitesse de defilement de la bande

| No. | Platine | Mode | Bande test | Points de réglage | Spécifications/valeurs (fréquence de lecture) | Remarques |
|---|---|---|---|---|---|---|
| 1 | I | Lecture à vitesse normale | STD-301 (3 kHz) | Après reproduction pendant 1 minute. | | |
| 2 | | Lecture à vitesse double | | Vérifier | 6000 Hz ± 600 Hz | |
| 3 | | Lecture à vitesse normale | | VR851 | 3000 Hz±5 Hz | |
| 4 | II | | | Après le contrôle, reproduire sur la Platine II. | | |
| 5 | | Lecture à vitesse double | | Après reproduction pendant 1 minute. | | |
| 6 | | Lecture à vitesse normale | | VR802 | Dans la limite de +/− 10 Hz de la valeur mesurée à l'étape 2 (Platine I). | |
| 7 | | | | Après le contrôle | | |
| 8 | | | | VR801 | 3000 Hz±5 Hz | |

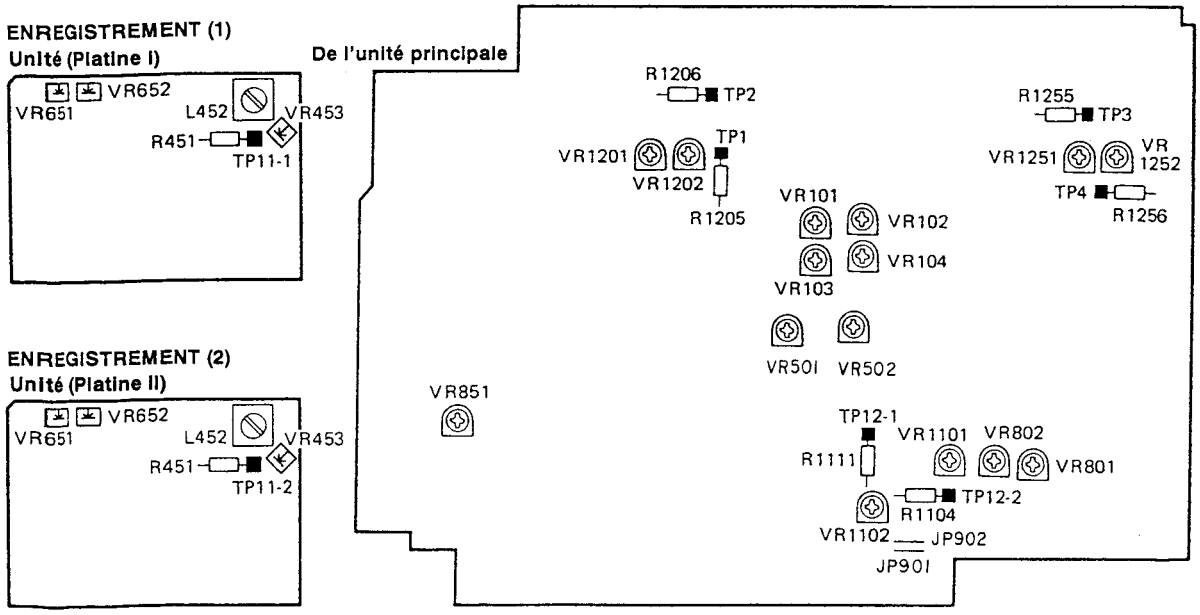



Fig. 8-1 Points de réglage

## 7.2 REGLAGES ELECTRIQUES

### Conditions de réglage

1. Les réglages mécaniques doivent tout d'abord être terminés.
2. Les têtes doivent être nettoyées et démagnétisées.
3. Mettre la platine sous tension et la laisser chauffer pendant au moins quelques minutes avant de commencer les réglages électriques.
4. Le signal de référence est de 0 dBv=1 Vrms.
5. Connecter une résistance de charge de 50 kΩ (tolérance 47k à 52 kΩ ) aux bornes de sortie (OUTPUT).
6. Sauf indication contraire, les commutateurs ci–dessous doivent être laissés sur les positions indiquées.
   DOLBY NR : OFF
   Sélecteur de bande : NORM
   (TAPE SELECTOR)

### Bandes d'essai

STD–331B : Réglages de la lecture (Voir fig. 7–2)
STD–630 : Bande vierge de type normal
STD–620 : Bande vierge de type chrome
STD–610 : Bande vierge de type métal

### Liste des réglages

#### Sections de lecture

1. Réglage de l'azimut de la tête.
2. Réglage du niveau de lecture.

#### Sections d'enregistrement

1. Réglage de l'oscillateur de polarisation.
2. Réglage du courant d'effacement.
3. Réglage de la polarisation d'enregistrement.
4. Réglage du niveau d'enregistrement.
5. Vérification de l'indicateur de niveau.
6. Réglage du fonctionnement de la détection de bande amorce.
7. Réglage de AUTO BLE

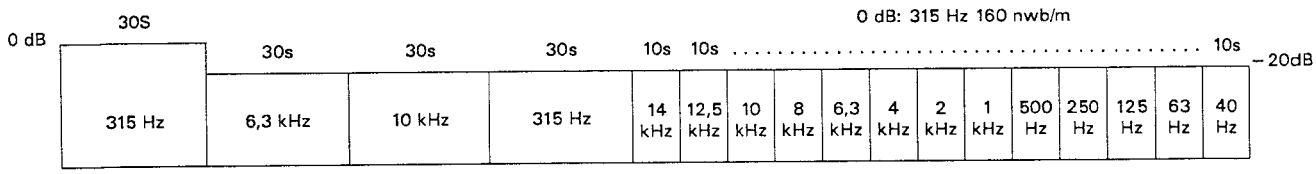



Fig. 7-2 Constantes de la bande d'essai STD-331B

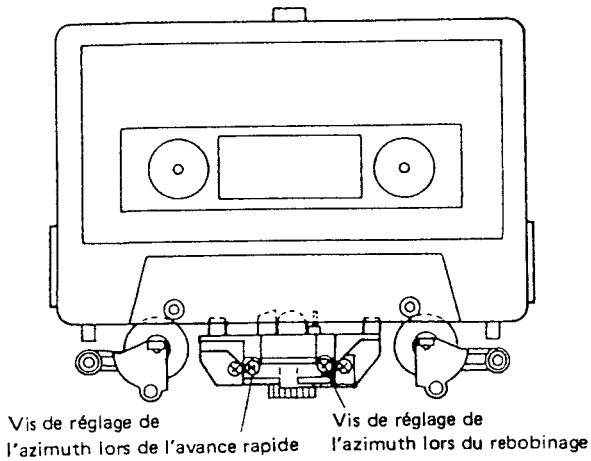



Fig. 7-3 Réglage de l'azimut de la tête

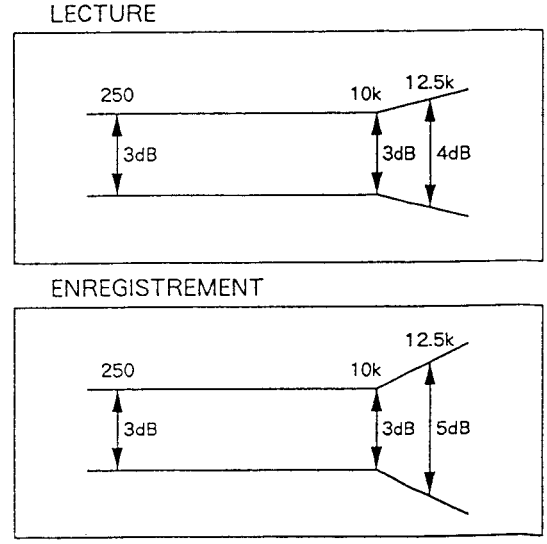



Fig. 7-4 Zone de réponse en fréquence

# SECTION DE LECTURE

## 1. Réglage de l'azimut de la tête

- Tourner VR 101, 102 (Platine I) ou VR103, 104 (Platine II) sur leur position centrale mécanique.

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|
| 1. | PLAY | Reproduire la section 10 kHz/–20 dB de la bande d'essai STD–331B. | Vis de réglage de l'azimut de la tête. (Voir fig. 7–3) | Sortie de ligne (LINE OUT) | Niveau du signal de reproduction maximum. | |
| 2. | STOP | Verrouiller la vis avec le verrouillage de vis après avoir terminé le réglage. | | | | |

## 2. Réglage du niveau de lecture

- Ce réglage détermine le niveau DOLBY NR et il doit être effectué très soigneusement.

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|
| 1. | PLAY | Reproduire la section 315 Hz/0 dB de la bande d'essai STD–331B. | Platine I | VR103 (can. G)<br>VR104 (can. D) | TP. 1 (can. G)<br>TP. 2 (can. D) | –10,7 dBv | |
| | | | Platine II | VR101 (can. G)<br>VR102 (can. D) | TP. 3 (can. G)<br>TP. 4 (can. D) | | |

# SECTION D'ENREGISTREMENT

## 1. Réglage de l'oscillateur de polarisation

- Régler l'oscillateur de polarisation, les platines étant réglées simultanément dans le mode d'enregistrement. ← (Enr/lec double seulement)

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|
| 1. | REC | Charger la bande d'essai STD–610 et n'introduire aucun signal. | Platine I | L452 | TP. 11–1 | 105 kHz ± 0,3 kHz | |
| | | | Platine II | L452 | TP. 11–2 | | |

## 2. Réglage du courant d'effacement

- Régler l'oscillateur de polarisation, les platines I et II étant réglées indépendamment dans le mode d'enregistrement. ← (Enr/lec double seulement)

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|
| 1. | REC | Charger la bande d'essai STD–610 et n'introduire aucun signal. | Platine I | VR453 | TP. 11–1 | 180 mV AC | |
| | | | Platine II | VR453 | TP. 11–2 | | |

## 3. Réglage de la polarisation d'enregistrement

- Régler l'oscillateur de polarisation, les platines I et II étant réglées indépendamment dans le mode d'enregistrement. ← (Enr/lec double seulement)
- Après le réglage, des précautions doivent être prises pour éviter une sous–polarisation en vérifiant le taux de distorsion.

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Régler le sélecteur de bande (TAPE SELECTOR) sur la position NORM. | | | | | |
| 2. | REC | Enregistrer les signaux 315 Hz et 6,3 kHz à un niveau d'entrée de –20 dBv et les reproduire. | Platine I | VR651 (can. G)<br>VR652 (can. D) | Sortie de ligne (LINE OUT) | Enregistrer, reproduire et régler de manière répétée de sorte que le niveau de lecture du signal 6,3 kHz devienne +0,5 dB ± 0,5 dB lorsqu'il est comparé avec le signal 315 Hz. | |
| | | | Platine II | VR651 (can. G)<br>VR652 (can. D) | | | |

## 4. Réglage du niveau d'enregistrement

- Régler l'oscillateur de polarisation, les platines I et II étant réglées indépendamment dans le mode d'enregistrement. ← (Enr/lec double seulement)

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Régler le sélecteur de bande (TAPE SELECTOR) sur la position NORM. | | | | | |
| 2. | REC/ PAUSE | Appliquer un signal de 315 Hz/0 dBv aux bornes d'entrée de ligne, charger la bande d'essai STD-630. | Volume de la commande de niveau d'enregistrement. | | TP. 1 (can. G) TP. 2 (can. D) | -11,2 dBv | |
| 3. | STOP | Régler le commutateur DOLBY NR sur la position ON. (DOLBY B) | | | | | |
| 4. | REC/ PLAY | Enregistrer le signal cidessus sur la bande d'essai STD-630 et le reproduire. | Platine I | VR1201 (can. G) VR1202 (can. D) | TP. 1 (can. G) TP. 2 (can. D) | Enregistrer, reproduire et régler de manière répétée de sorte que le niveau du signal devienne -11,2 dB. | |
| | | | Platine II | VR1251 (can. G) VR1252 (can. D) | | | |
| 5. | STOP | Régler le sélecteur de bande (TAPE SELECTOR) sur la position CrO2. | | | | | |
| 6. | REC/ PLAY | Enregistrer le signal cidessus sur la bande d'essai STD-620 et le reproduire. | Vérifier | | TP. 1 (can. G) TP. 2 (can. D) | -11,2 dBv ± 1,5 dB | |
| 7. | STOP | Régler le sélecteur de bande (TAPE SELECTOR) sur la position METAL. | | | | | |
| 8. | REC/ PLAY | Enregistrer le signal cidessus sur la bande d'essai STD-610 et le reproduire. | Vérifier | | TP. 1 (can. G) TP. 2 (can. D) | -11,2 dBv ± 1,5 dB | |

## 5. Vérification de l'indicateur de niveau

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Appliquer un signal de 315 Hz/-10 dBv (316 mV) aux bornes d'entrée de ligne. | Volume de la commande de niveau d'enregistrement | TP. 1 (can. G) TP. 2 (can. D) | Vérifier que les indicateurs de niveau "0 dB" s'allument dans la limite de -11,2 dBv ± 2 dB du niveau de sortie du signal. | |

## 6. Réglage du fonctionnement de la détection de bande amorce

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | | Points de mesure | | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|---|---|
| 1. | PLAY | Pas d'entrée – Charger une moitié de cassette vide. | Platine I | VR1102 | Deck I | TP. 12-1 | $1{,}0V \pm \frac{0}{0{,}1}$ V (DC) | |
| | | | Platine II | VR1102 | Deck II | TP. 12-2 | | |
| 2. | Vérifier que l'opération de détection de bande amorce s'effectue correctement (à la fois dans le sens avant (FWD) et inverse (REV) dans le mode d'inversion sans fin). | | | | | | | |

## 7. Réglage de AUTO BLE

- Le réglage de BLE doit être effectués que tous les autres réglages ont été complétés.
- Ce réglage doit être effectué dans le mode d'essai.
- Passage au mode d'essai. (Se reporter page 34.)

| No. | Mode | Signal d'entrée et bande d'essai | Points de réglage | Points de mesure | Valeur de réglage | Remarques |
|---|---|---|---|---|---|---|
| 1. | – | Régler dans le mode d'essai. | – | – | – | |
| 2. | | Appuyer sur la touche PARALLEL REC du panneau avant. | Indicateur de niveau. | VR501 | Régler afin que 0 dB clignote sur l'indicateur de niveau. | Réglage 400 Hz |
| 3. | | Appuyer sur la touche NORMAL SPEED. | | VR502 | Régler afin que 0 dB clignote sur l'indicateur de niveau. | Réglage 10 kHz |

# 7. AJUSTES

## 7.1 AJUSTE MECANICO

- Este ajuste debe efectuarse en el modo de prueba.
- Cómo poner el modo de prueba

Cortocircuite JP901 y JP902 durante un corto tiempo. (La unidad se pondrá en el MODO DE PRUEBA).

| Mode | Operatión | Indicación |
|---|---|---|
| Reproducción a doble velocidad para el lado I | La reproducción a doble velocidad se selecciona al mantener pulsada la tecla FAST (lado I o II) durante la reproducción del lado I. (Antes de seleccionar otro modo, pulse primero la tecla STOP). | C-03 |
| Reproducción a doble velocidad para el lado II | La reproducción a doble velocidad se selecciona al mantener pulsada la tecla FAST (lado I o II) durante la reproducción del lado II. (Antes de seleccionar otro modo, pulse primero la tecla STOP). | C-04 |

Para cancelar el modo de prueba, pulse la tecla COUNTER RESET del lado I o desconecte la alimentación de la unidad.

1. Ajuste y verificación de la velocidad de cinta

| No. | Platina | Modo | Cinta de prueba | Puntos de ajuste | Especificaciones/valores nominales (frecuencia de reproducción) | Comentarios |
|---|---|---|---|---|---|---|
| 1 | I | PLAY (velocidad normal) | STD-301 (3 kHz) | Después de reproducir durante 1 minuto. | | |
| 2 | | PLAY (velocidad doble) | | Verificar | 6000 Hz ± 600 Hz | |
| 3 | | PLAY (velocidad normal) | | VR851 | 3000 Hz ± 5 Hz | |
| 4 | II | | | Después de verificar, reproduzca en la platina II. | | |
| 5 | | PLAY (velocidad doble) | | Después de reproducir durante 1 minuto. | | |
| 6 | | PLAY (velocidad normal) | | VR802 | Dentro de +/− 10 Hz del valor medido en el paso 2 (platina I). | |
| 7 | | | | Después de verificar. | | |
| 8 | | | | VR801 | 3000 Hz ± 5 Hz | |

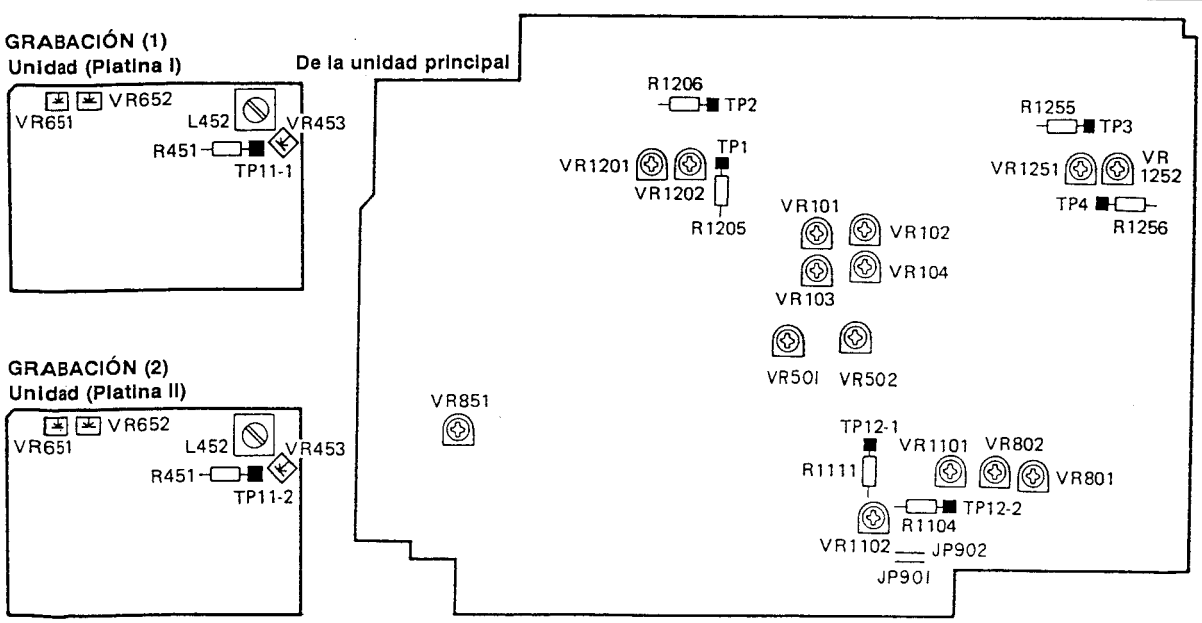



Figura. 8-1 Puntos de ajuste

## 7.2 AJUSTES ELÉCTRICOS

### Condiciones de ajuste

1. Los ajustes mecánicos deben haberse completado primero.
2. La cabeza debe estar limpia y desmagnetizada.
3. Encienda la alimentación para permitir que la platina se caliente durante unos pocos minutos por lo menos antes de realizar cualquier ajuste eléctrico.
4. La señal de referencia es de 0 dBv=1 Vrms.
5. Conecte una resistencia de 50 kΩ (o entre 47k y 52 kΩ ) en los terminales OUTPUT.
6. A menos que se especifique lo contrario, los conmutadores indicados más abajo deben dejarse en las posiciones indicadas.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

### Cintas de prueba

STD-331B : Ajustes de reproducción (Consulte la figura 7-2)
STD-630 : Cinta virgen NORMAL
STD-620 : Cinta virgen de $CrO_2$
STD-610 : Cinta virgen de METAL

### Lista de ajustes

#### Secciones de reproducción

1. Ajuste de azimut de la cabeza
2. Ajuste del nivel de reproducción

#### Secciones de grabación

1. Ajuste del oscillador de polarización
2. Ajuste de la corriente de borrado
3. Ajuste de la polarización de grabación
4. Ajuste del nivel de grabación
5. Verificación del medidor de nivel
6. Ajuste de la operación de detección del extremo inicial de cinta
7. Ajuste BLE automático

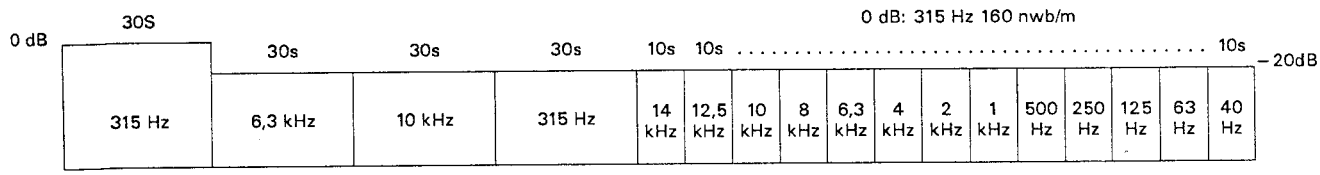



Figura 7-2 Constantes de la cinta de prueba STD-331B

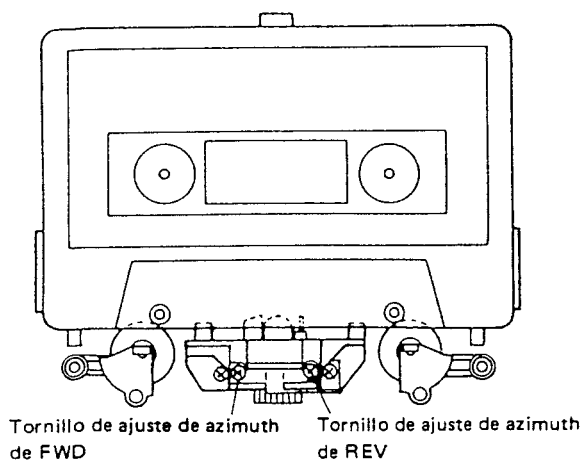



Figura 7-3 Ajuste de azimut de la cabeza

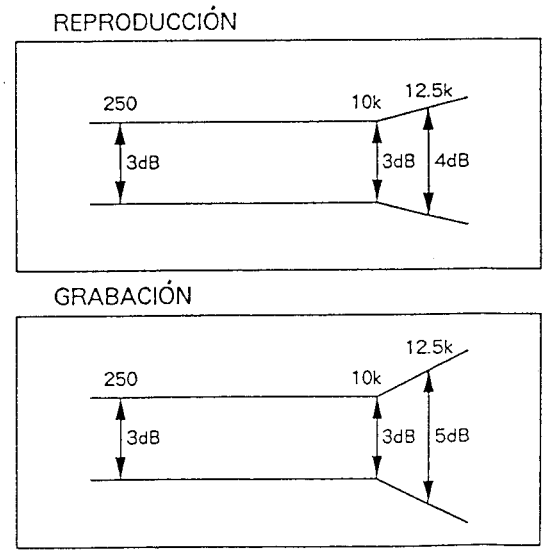



Figura 7-4 Zona permisible de respuesta de frecuencia de reproducción

# SECCIÓN DE REPRODUCCIÓN

## 1. Ajuste del azimut de la cabeza

- Poner VR101, 102 (platina I) o VR103, 104 (platina II) en las posiciones del centro mecánico.

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|
| 1. | PLAY | Reproduzca la sección de 10 kHz/–20 dB de la cinta de prueba STD–331B. | Tornillo de ajuste del azimut de la cabeza. (Vea la figura 7–3) | LINE OUT | Nivel máximo de la señal de reproducción. | |
| 2. | STOP | Bloquee el tornillo con su cierre una vez finalizado el ajuste. | | | | |

## 2. Ajuste del nivel de reproducción

- Este ajuste determina el nivel DOLBY NR y debe realizarse con mucho cuidado.

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|
| 1. | PLAY | Produzca la parte de 315 Hz/0 dB de la cinta de prueba STD–331B. | Platina I | VR103 (Lch) VR104 (Rch) | TP. 1 (Lch) TP. 2 (Rch) | –10,7 dBv | |
| | | | Platina II | VR101 (Lch) VR102 (Rch) | TP. 3 (Lch) TP. 4 (Rch) | | |

# SECCIÓN DE GRABACIÓN

## 1. Ajuste del oscilador de polarización

Ajuste el oscilador de polarización con los platinas puestas simultáneamente en el modo de grabación. (Doble G/R sólo)

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|
| 1. | REC | Introduzca la cinta de prueba STD–610 sin señal de entrada. | Platina I | L452 | TP. 11–1 | 105 kHz ± 0,3 kHz | |
| | | | Platina II | L452 | TP. 11–2 | | |

## 2. Ajuste de la corriente de borrado

- Ajuste el oscilador de polarización con las platinas I y II puestas independientemente en el modo de grabación. → (Doble G/R sólo)

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|
| 1. | REC | Introduzca la cinta de prueba STD–610 sin señal de entrada. | Platina I | VR453 | TP. 11–1 | 180 mV AC | |
| | | | Platina II | VR453 | TP. 11–2 | | |

## 3. Ajuste de polarización de grabación

- Ajuste el oscilador de polarización estando las platinas I y II ajustadas independientemente para el modo de grabación. → (Doble G/R sólo)
- Una vez finalizado el ajuste, compruebe el porcentaje de distorsión para no obtener subpolarización.

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Ponga el conmutador TAPE SELECTOR en la posición NORM. | | | | | |
| 2. | REC | Grabe la señal de 315 Hz y 6,3 kHz a un nivel de entrada de –20 dBv y reprodúzcala. | Platina I | VR651 (Lch) VR652 (Rch) | LINE OUT | Grabe, reproduzca y ajuste repetidamente para que el nivel de la señal de reproducción de 6,3 kHz sea de +0,5 dB ± 0,5 dB cuando se compare con la señal de 315 Hz. | |
| | | | Platina II | VR651 (Lch) VR652 (Rch) | | | |

## 4. Ajuste del nivel de grabación

- Ajuste el oscilador de polarización con las platinas I y II puestas independientemente en el modo de grabación. → (Doble G/R sólo)

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|
| 1. | STOP | Ponga el conmutador TAPE SELECTOR en la posición NORM. | | | | | |
| 2. | REC/ PAUSE | Aplique una señal de 315 Hz/0 dBv a los terminales de entrada de línea e introduzca la cinta de prueba STD–630. | Control de nivel de grabación. | | TP. 1 (Lch) TP. 2 (Rch) | –11,2 dBV | |
| 3 | STOP | Ponga el conmutador DOLBY NR en la posición ON. (DOLBY B) | | | | | |
| 4. | REC/ PLAY | Grabe la señal de arriba en la cinta de prueba STD–630 y reprodúzcala. | Platina I | VR1201 (Lch) VR1202 (Rch) | TP. 1 (Lch) TP. 2 (Rch) | Grabe, reproduzca y ajuste repetidamente para que el nivel de la señal de reproducción sea de –11,2 dB. | |
| | | | Platina II | VR1251 (Lch) VR1252 (Rch) | | | |
| 5. | STOP | Ponga el conmutador TAPE SELECTOR en la posición CrO2. | | | | | |
| 6. | REC/ PLAY | Grabe la señal de arriba en la cinta de prueba STD–620 y reprodúzcala. | Verifique | | TP. 1 (Lch) TP. 2 (Rch) | –11,2 dBv ± 1,5 dB | |
| 7. | STOP | Ponga el conmutador TAPE SELECTOR en la posición METAL. | | | | | |
| 8. | REC/ PLAY | Grabe la señal de arriba en la cinta de prueba STD–610 y reprodúzcala. | Verifique | | TP. 1 (Lch) TP. 2 (Rch) | –11,2 dBv ± 1,5 dB | |

## 5. Verificación del medidor de nivel

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Aplique una señal de 315 Hz/–10 dBv (316 mV) a los terminales de entrada de línea. | Control de nivel de grabación | TP. 1 (Lch) TP. 2 (Rch) | Verifique si se encienden los medidores de nivel "0 dB" cuando el nivel de salida de la señal sea –11,2 dBv ± 2 dB. | |

## 6. Ajuste de la operación de detección del extremo incial de la cinta

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | | Punto de medición | | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|---|---|
| 1. | PLAY | Sin entrada – Introduzca un casete vacío la mitad. | Platina I | VR1102 | Platina I | TP. 12–1 | $1{,}0V \pm \frac{0}{0{,}1}$ V (DC) | |
| | | | Platina II | VR1102 | Platina II | TP. 12–2 | | |
| 2. | Confirme que la función de detección del extremo inicial de la cinta funcione correctamente (en el modo de inversión sin fin, compruebe tanto en la dirección de avance como en la de retroceso). | | | | | | | |

## 7. Ajuste BLE Automático

- El ajuste BLE debe efectuarse después de haber terminado todos los otros ajustes.
- Este ajuste debe efectuarse en el modo de prueba.
- Cómo poner el modo de prueba. (consúltese la página 38.)

| N.° | Modo | Señal de entrada y cinta de prueba | Punto de ajuste | Punto de medición | Valor de ajuste | Comentarios |
|---|---|---|---|---|---|---|
| 1. | – | Ponga el modo de prueba. | – | – | – | |
| 2. | | Pulse la tecla PARALLEL REC del panel delantero. | Medidor de nivel | VR501 | Ajuste de modo que parpadee 0 dB en el medidor de nivel. | Ajuste de 400 Hz |
| 3. | | Pulse la tecla NORMAL SPEED. | | VR502 | Ajuste de modo que parpadee 0 dB en el medidor de nivel. | Ajuste de 10 kHz |

# 8. IC DESCRIPTIONS

## 8.1 PD4296A PIN FUNCTIONS

| Pin No. | Name | Function | I/O | Voltage (V) in "H" | Voltage (V) in "L" |
|---|---|---|---|---|---|
| 1 to 4<br>55, 58 to 63 | S0 to S10 | Segment terminal for display, key scan and level scan<br>S0 to S10 → Display<br>S0 to S9 → Key scan<br>S0 to S4 → Level scan | O | 4 to 5 | approx. –28 |
| 40 to 50 | T0 to T10 | Grid terminal for display | O | 4 to 5 | approx. –28 |
| 5 to 8 | KEYIN0 to KEYIN3 | Input port for key scan | I | 3.75 to 5 | 0 to 1 |
| 9 | POWER OFF | When POWER OFF: "H" | I | 3.5 to 5 | 0 to 1.5 |
| 10 | REMOCON | Remote control code input port<br>When no remote control code input: "H" | I | 3.5 to 5 | 0 to 1.5 |
| 11<br>12 | METER L<br>METER R | Lch level scan input port<br>Rch level scan input port | I | 3.75 to 5 | 0 to 1 |
| 13<br>14 | SENSING2<br>SENSING1 | SENSING input port side 2<br>SENSING input port side 1<br>When right side reel base is rotating: <br>When right side reel base is stopped, "H" or "L" is constant. | I | 3.5 to 5 | 0 to 1.5 |
| 15 | SONG | SONG input port<br>When there is a signal input to MS circuit: "H"<br>When no signal input: "L" | I | 3.5 to 5 | 0 to 1.5 |
| 16 | FROM CD | CD SYNCHRO input port<br>REC/PAUSE by EDGE input in "H".<br>REC (release PAUSE) by EDGE input in "L". | I | 3.5 to 5 | 0 to 1.5 |
| 17 | REC MUTE1 | REC MUTE output terminal side 1. "H": REC MUTE ON | O | 4 to 5 | 0 to 0.5 |
| 18 | $\overline{\text{LINE MUTE}}$ | LINE MUTE output terminal. "L": LINE MUTE ON | O | 4 to 5 | 0 to 0.5 |
| 19<br>20 | LEADER1<br>LEADER2 | LEADER TAPE input port side 1<br>LEADER TAPE input port side 2<br>TAPE LEADER portion: "H" | I | 3.5 to 5 | 0 to 1.5 |
| 21 | REC MUTE2 | REC MUTE output terminal side 2. "H": REC MUTE ON | O | 3.25 to 5 | 0 to 1 |
| 22 | BIAS2 | BIAS ON output port side 2. "H": BIAS ON | O | 3.25 to 5 | 0 to 1 |
| 23 | SOL A2 | SOLENOID A output port side 2 | O | 3.25 to 5 | 0 to 1 |
| 24 | SOL B2 | SOLENOID A low voltage control port side 2. "H": low voltage | O | 3.25 to 5 | 0 to 1 |
| 25 | RM–R2 | REEL MOTOR RIGHT output port side 2 | O | 3.5 to 5 | 0 to 1.5 |
| 26 | RM–L2 | REEL MOTOR LEFT output port side 2 | O | 3.5 to 5 | 0 to 1.5 |
| 27 | CPM2 | CAPSTAN MOTOR output port side 2 | O | 3.5 to 5 | 0 to 1.5 |
| 28 | RM–PLAY2 | REEL MOTOR PLAY TORQUE output port side 2 | O | 3.5 to 5 | 0 to 1.5 |
| 29 | 400 Hz/10 kHz OSC | AUTO BLE rectangular wave output terminal | O | 4.6 to 5 | 0 to 0.4 |

| Pin No. | Name | Function | I/O | Voltage (V) in "H" | Voltage (V) in "L" |
|---|---|---|---|---|---|
| 30<br>31 | X1<br>X2 | Ceramic lock connection terminal for main system clock oscillation | | 4.6 to 5 | 0 to 0.4 |
| 32 | Vss | Ground potential terminal | | | |
| 35 | $\overline{BLK}$ | Extension control output terminal. "H": extension output ON | O | 4 to 5 | 0 to 2 |
| 36 | DATA | Extension output DATA terminal | O | 4 to 5 | 0 to 2 |
| 37 | CLK | Extension control output terminal | O | 4 to 5 | 0 to 2 |
| 38 | WR | Extension control output terminal | O | 4 to 5 | 0 to 2 |
| 39 | $\overline{RESET}$ | RESET: "L" | I | 3.75 to 5 | 0 to 1 |
| 51 | BIAS1 | BIAS ON output port side 1. "H": BIAS ON | O | 4 to 5 | 0 to 0.5 |
| 52 | COPY | COPY output terminal<br>When COPY: "H". Sets analog switch (Pins ⑤ and ⑥ of IC506) to "H" and Pins ⑫ and ⑬ to "L", and selects the signal pass as follows:<br>LINE OUT of DOLBY IC side 1 → COPY<br>VR → LINE IN of DOLBY IC side 2 | O | 4 to 5 | –4 to –5 |
| 53 | BLE ON | BLE ON output terminal<br>When AUTO BLE: "H"<br>When TEST MODE: "H" | O | 4 to 5 | –4 to –5 |
| 54 | OSC FRQ SEL | OSCILLATOR FREQUENCY SELECT output terminal<br>During AUTO BLE (TEST MODE);<br>400 Hz: "H"<br>10 kHz: "L" | O | 4 to 5 | –4 to –5 |
| 56 | VLOAD | Connected nowhere inside the microprocessor.<br>Open terminal (used when mask option) | | | |
| 57 | VPRE | Power supply terminal for FL display output buffer | | –3.5 to –5 | |

## 8.2 LC7570 PIN FUNCTIONS

| Pin No. | Name | Function | I/O | Voltage (V) in "H" | Voltage (V) in "L" |
|---|---|---|---|---|---|
| 1 | VFL | Pull-down resistor common terminal (pulled down to ground) | | | |
| 2 | WR | Extension control input terminal | I | 3.5 to 5 | 0 to 1.5 |
| 3 | CLK | Extension control input terminal | I | 3.5 to 5 | 0 to 1.5 |
| 4 | DATA | Extension input DATA terminal | I | 3.5 to 5 | 0 to 1.5 |
| 5 | VDD | Power terminal (+5V) | | | |
| 6 | $\overline{BLK}$ | Extension control input terminal<br>$\overline{BLK}$= "L" (Vss)... extension output OFF<br>$\overline{BLK}$= "H" (VDD)... extension output ON | I | 3.5 to 5 | 0 to 1.5 |
| 7 | Vss | Power terminal (GND) | | | |
| 9<br>10 | 2×2<br>1×1 | Double speed control output terminal side 2<br>Double speed control output terminal side 1<br>When double speed copy: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 11 | DOLBY SELECT | DOLBY IC SELECT control output terminal<br>When DOLBY IC side 1 is selected: "H"<br>When decoding side 1 and double speed copying: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 12 | RECOVERY FAST | RECOVERY FAST/SLOW control output terminal<br>Controls time constant in meter circuit. The falling at level input becomes sooner in "H" level.<br>When LINE MUTE is closed: "H", when fetching the playback signal during AUTO-BLE: "H". | O | 2.2 to 5 | 0 to 2.2 |
| 13 | TOCD | CD DECK SYNCHRO COPY control output terminal<br>When DECK REC (CD play) mode: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 14 | DECODE2 | ENCODE/DECODE control output port side 2<br>When PLAY, PLAY/PAUSE, CUE and REVIEW modes in side 2: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 15 | RM-PLAY1 | REEL MOTOR PLAY TORQUE output port side 1 | O | 2.2 to 5 | 0 to 2.2 |
| 16 | CPM1 | CAPSTAN MOTOR output port side 1 | O | 2.2 to 5 | 0 to 2.2 |
| 17 | RM-L1 | REEL MOTOR LEFT output port side 1 | O | 2.2 to 5 | 0 to 2.2 |
| 18 | RM-R1 | REEL MOTOR RIGHT output port side 1 | O | 2.2 to 5 | 0 to 2.2 |
| 19 | SOL B1 | SOLENOID A low voltage control port side 1. "H": low voltage | O | 2.2 to 5 | 0 to 2.2 |
| 20 | SOL A1 | SOLENOID A output port side 1 | O | 2.2 to 5 | 0 to 2.2 |
| 21 | DECODE1 | ENCODE/DECODE control output port side 1<br>When PLAY, PLAY/PAUSE, CUE and REVIEW modes in side 1: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 22 | ×2 COPY DSP | When double speed copy:display control output port. When double speed copy: "H"<br>(When double speed copy:lights off the DOLBY B and C displays.) | O | 2.2 to 5 | 0 to 2.2 |
| 26<br>25<br>24<br>23 | 2LEVEL-0<br>2LEVEL-1<br>2LEVEL-2<br>2LEVEL-3 | AUTO-BLE LEVEL adjustment DATA output port side 2<br>When AUTO-BLE is not adjusted:<br>2LEVEL-3: "H"<br>2LEVEL-2: "L"<br>2LEVEL-1: "L"<br>2LEVEL-0: "L" | O | 2.2 to 5 | 0 to 2.2 |

| Pin No. | Name | Function | I/O | Voltage (V) in "H" | Voltage (V) in "L" |
|---|---|---|---|---|---|
| 30<br>29<br>28<br>27 | 2EQ–0<br>2EQ–1<br>2EQ–2<br>2EQ–3 | AUTO–BLE EQUALIZER adjustment DATA output port side 2<br>When AUTO–BLE is not adjusted:<br>2EQ–3: "L"<br>2EQ–2: "H"<br>2EQ–1: "H"<br>2EQ–0: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 32<br>31 | 2BIAS–0<br>2BIAS–1 | AUTO–BLE BIAS adjustment DATA output port side 2<br>When AUTO–BLE is not adjusted:<br>2BIAS–1: "H"<br>2BIAS–0: "L" | O | 2.2 to 5 | 0 to 2.2 |
| 34<br>33 | 1BIAS–0<br>1BIAS–1 | AUTO–BLE BIAS adjustment DATA output port side 1<br>When AUTO–BLE is not adjusted:<br>1BIAS–1: "H"<br>1BIAS–0: "L" | O | 2.2 to 5 | 0 to 2.2 |
| 38<br>37<br>36<br>35 | 1EQ–0<br>1EQ–1<br>1EQ–2<br>1EQ–3 | AUTO–BLE EQUALIZER adjustment DATA output port side 1<br>When AUTO–BLE is not adjusted:<br>1EQ–3: "L"<br>1EQ–2: "H"<br>1EQ–1: "H"<br>1EQ–0: "H" | O | 2.2 to 5 | 0 to 2.2 |
| 42<br>41<br>40<br>39 | 1LEVEL–0<br>1LEVEL–1<br>1LEVEL–2<br>1LEVEL–3 | AUTO–BLE LEVEL adjustment DATA output port side 1<br>When AUTO–BLE is not adjusted:<br>1LEVEL–3: "H"<br>1LEVEL–2: "L"<br>1LEVEL–1: "L"<br>1LEVEL–0: "L" | O | 2.2 to 5 | 0 to 2.2 |

# 9. FOR CT–W950R/HEM, HB AND CT–W960R/SD TYPES

## CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

**The CT–W950R/HEM, HB and CT–W960R/SD types are the same as the CT–W51/KUC type with the exception of the following sections.**

| Mark | Symbol & Description | Part No. | | | | Remarks |
|---|---|---|---|---|---|---|
| | | CT–W51/ KUC type | CT–W950R/ HEM type | CT–W950R/ HB type | CT–W960R/ SD type | |
| | Main unit | Non supply | Non supply | Non supply | Non supply | |
| | Display unit | Non supply | Non supply | Non supply | Non supply | |
| ⚠ | Strain relief | CM–22C | CM–22B | CM–22B | CM–22B | |
| ⚠ | AC Power cord | PDG1015 | PDG1003 | PDG1036 | PDG1013 | |
| ⚠ | FU1001, FU1002 Fuse (1.5A) | REK1001 | ..... | ..... | ..... | |
| ⚠ | FU1001, FU1002 Fuse (1.6A) | ..... | REK–102 | REK–102 | REK–102 | |
| ⚠ | Power transformer (AC120V) | RTT1162 | ..... | ..... | ..... | |
| ⚠ | Power transformer (AC220–230/230–240V) | ..... | RTT1163 | RTT1163 | ..... | |
| ⚠ | Power transformer (AC110/120–127/220/240V) | ..... | ..... | ..... | RTT1164 | |
| ⚠ | Voltage selector | ..... | ..... | ..... | PSB1002 | |
| | FL filter | RAH1596 | RAH1597 | RAH1597 | RAH1672 | |
| | FL lens | RAH1883 | RAH1594 | RAH1594 | RAH1567 | |
| | Front panel assembly | RXX1411 | RXX1368 | RXX1368 | RXX1367 | |
| | Packing case | RHG1286 | RHG1240 | RHG1240 | RHG1266 | |
| | Operating instructions (English) | RRB1079 | ..... | RRB1079 | RRB1079 | |
| | Operating instructions (Dutch/Swedish/Spanish/Portuguese) | ..... | RRD1096 | ..... | ..... | |
| | Operating instructions (English/French/German/Italian) | ..... | RRE1039 | ..... | ..... | |
| | Connection cord (Mini) | PDE–319 | ..... | ..... | ..... | |
| | Remote control unit | ..... | ..... | ..... | RPX1008 | |
| | Case (C) | ..... | ..... | ..... | VNK–634 | Battery cover |

## MAIN UNIT

**The main units (for CT–W950R/HEM, HB and CT–W960R/SD types) are the same as the main unit (for CT–W51/KUC type) with the exception of the following sections.**

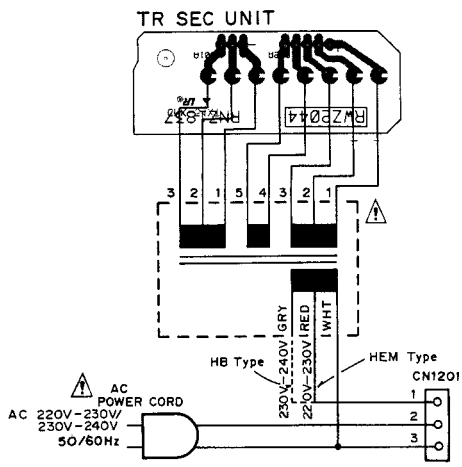
| Mark | Symbol & Description | Part No. | | Remarks |
|---|---|---|---|---|
| | | CT–W51/ KUC type | CT–W950R/HEM, HB and CT–W960R/ SD types | |
| | D1604–D1606 | 1SS254 | ..... | |
| | C1608 | CKCYF473Z50 | ..... | |
| | JA1603, JA1604 | RKN1004 | ..... | |

## DISPLAY UNIT

**The display units (for CT–W950R/HEM, HB and CT–W960R/SD types) are the same as the main unit (for CT–W51/KUC type) with the exception of the following sections.**

| Mark | Symbol & Description | Part No. | | | Remarks |
|---|---|---|---|---|---|
| | | CT–W51/ KUC type | CT–W950R/ HEM and HB types | CT–W960R/ SD type | |
| | V1501<br>Remote control sensor | RAW1080<br>..... | RAW1076<br>..... | RAW1080<br>HC–177 | |

## POWER supply section for HEM and HB type

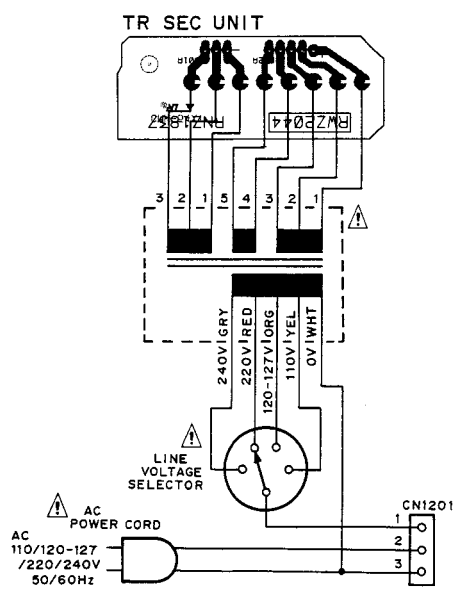



Line Voltage Selection

Line voltage can be changed with the following steps.
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the connection of the power transformer primary taps.
4. Stick the line voltage label on the rear panel.

| Port NO. | Description | |
|---|---|---|
| AXX-193 | 220V label | —— 220-230 |
| AXX-192 | 240V label | ----- 230-240 |

## POWER supply section for SD type



# 10. SPECIFICATIONS

System ..... 4 track, 2-channel stereo
Heads ..... "Laser amorphous" recording/playback head × 2
"Ferrite" erasing head × 2
Motor ..... DC servo capstan motor × 2
DC reel motor × 2
Wow and Flutter ..... No more than 0.055% (WRMS) (JIS)
No more than ±0.16% (DIN)
Fast Winding Time ..... Approximately 90 seconds
(C-60 tape)

Frequency Response
−20 dB recording:
Metal tape ..... 20 to 20,000 Hz
Chrome tape ..... 20 to 19,000 Hz
Normal tape ..... 20 to 18,000 Hz
Signal-to-Noise Ratio
Dolby NR OFF ..... More than 57 dB
Noise Reduction Effect
Dolby B-type NR ON ..... More than 10 dB (at 5 kHz)
Dolby C-type NR ON ..... More than 19 dB (at 5 kHz)
Harmonic Distortion ..... No more than 0.7% (0 dB)
Input (Sensitivity)
LINE (INPUT) ..... 63 mV (Input impedance 57 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 316 mV (Output impedance 3.2 kΩ)
Headphone ..... 0.25 mW (Load impedance 8 Ω)

## Subfunctions

- Twin AUTO BLE system
- Quick auto reverse
- Double recording/playback reverse
- DOLBY HX PRO recording function
- DOLBY B/C types NR
- Relay recording
- Parallel recording
- Music search over ±15 selections
- High-speed and normal-speed copy (DECK I→DECK II)
- Relay playback/blank skip
- CD•DECK SYNCHRO recording capability
- Peak level meter with peak-hold function
- Automatic space recording mute
- Automatic tape selector
- SR System remote control available (U.S. and Canadian model)
- TIMER Recording
- TIMER Playback (Automatic relay on)
- 2-mode electronic 4-digit twin tape counter
- Headphone jack
- Wireless remote control operation (CT-W960R)
- Copy level control (normal speed copy)
- Dolby NR type convertible copy (normal speed copy)

## Miscellaneous

Power Requirements
U.S., Canadian models ..... AC 120V, 60 Hz
Australian models ..... AC 230−240 Volts~, 50/60 Hz
U.K. models ..... AC 230−240 Volts~, 50/60 Hz
European models ..... AC 220−230 Volts~, 50/60 Hz
Multi-voltage models ..... AC 110V/120V−127V/220V/240V
(switchable), 50/60 Hz

Power Consumption
CT-W51/CT-W950R ..... 32W
CT-W960R ..... 32W
Dimensions ..... 420(W) × 135(H) × 318.5(D) mm
16-9/16(W) × 5-5/16(H) × 12-7/16(D) in
Weight (without package) ..... 5.7 kg (12 lb 6 oz.)

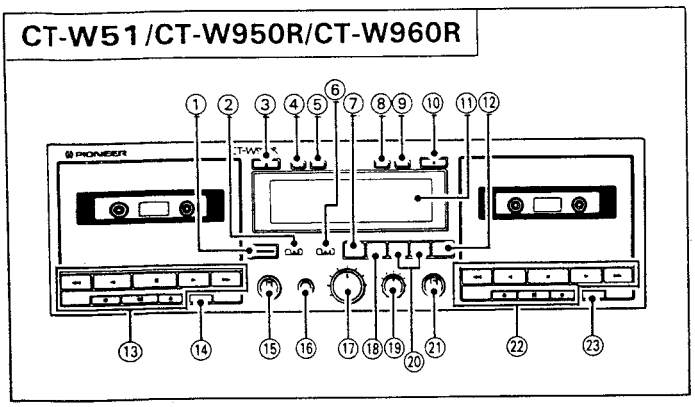
## Accessories

Operating instructions ..... 1
Connection cord with pin plugs ..... 2
SR Remote control cord
(U.S. and Canadian models) ..... 1
CD•DECK SYNCHRO control cord ..... 1
Remote control unit (CT-W960R) ..... 1
Dry cell batteries (size AAA/IEC R03) (CT-W960R) ..... 2

*NOTE:*
*Specifications and design subject to possible modifications without notice, due to improvements.*

# 11. PANEL FACILITIES

CT-W51/CT-W950R/CT-W960R




① **Power switch (POWER ■ OFF/ ▬ ON)**
② **Timer mode switch (TIMER MODE REC/OFF/PLAY)**
③ **DECK I eject button ( ⏏ )**
Stop a tape running before opening the door.
④ **DECK I counter reset button (RESET)**
⑤ **DECK I counter mode button (TIME/COUNT)**
⑥ **Reverse mode switch (REVERSE MODE)**
⑦ **Relay/skip button (RELAY/SKIP)**
⑧ **DECK II counter reset button (RESET)**
⑨ **DECK II counter mode button (TIME/COUNT)**
⑩ **DECK II eject button ( ⏏ )**
Stop a tape running before opening the door.
⑪ **Function display**
⑫ **CD•DECK SYNCHRO recording button (CD SYNCHRO)**
⑬ **DECK I operation buttons**
◀◀/MS: Fast reverse/music search
◀ : Reverse playback
■ : Stop
▶ : Forward playback
▶▶/MS: Fast forward/music search
O : Recording mute (CT-W51/CT-W950R/CT-W960R only)
❚❚ : Pause (CT-W51/CT-W950R/CT-W960R only)
● : Recording (CT-W51/CT-W950R/CT-W960R only)
⑭ **DECK I AUTO BLE button (CT-W51/CT-W950R/CT-W960R only)**
⑮ **DECK I Dolby* NR switch (DOLBY NR B/OFF/C)**
⑯ **Headphones jack (PHONES)**
⑰ **Recording level control (REC LEVEL)**
⑱ **Parallel recording button (PARALLEL REC) (CT-W51/CT-W950R/CT-W960R only)**
⑲ **Copying level control (COPY LEVEL)**
⑳ **Synchro copy buttons (SYNCHRO COPY)**
NORMAL SPEED: Normal speed copy
HIGH SPEED : Double speed copy
㉑ **DECK II Dolby* NR switch (DOLBY NR B/OFF/C)**
㉒ **DECK II operation buttons**
◀◀/MS: Fast reverse/music search
◀ : Reverse playback
■ : Stop
▶ : Forward playback
▶▶/MS: Fast forward/music search
O : Recording mute
❚❚ : Pause
● : Recording
㉓ **DECK II AUTO BLE button**

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*
- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol ◻◻ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

## FEATURES OF AUTO BLE

With commercially available cassette tapes, sensitivity and frequency characteristics might differ slightly from one another, even though the same sound adjustment is set for them. To utilize tape characteristics to the maximum possible and realize an ideal recording which reproduces the source exactly, optimum recording level (sensitivity) and equalizer values must be set accordingly for each tape. In many conventional tape decks, standard values are fixed for standard tapes, thus nullifying the subtle differences between individual tapes. Perfect tuning by ear through use of fine adjustment controllers for bias and sensitivity is difficult and requires a lot of effort. It is especially difficult with a 2-head deck where the recording sound cannot be monitored.
The AUTO BLE on this unit automatically adjusts bias, level and equalizer by using a microprocessor to set the optimum recording characteristics accordingly for each tape.